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**VALVES AND  
FITTINGS  
FOR ALL  
PRESSURES  
AND PURPOSES**

**CATALOGUE  
No. 50  
JUNE, 1917**

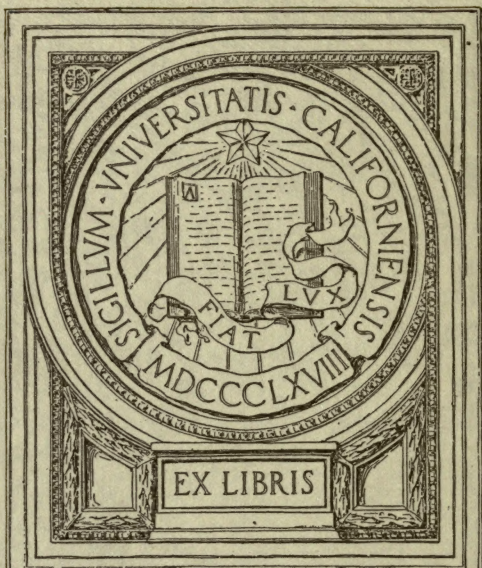
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**CRANE CO.**

836 SO. MICHIGAN AVE.

**CHICAGO**

**OAKLAND BRANCH**




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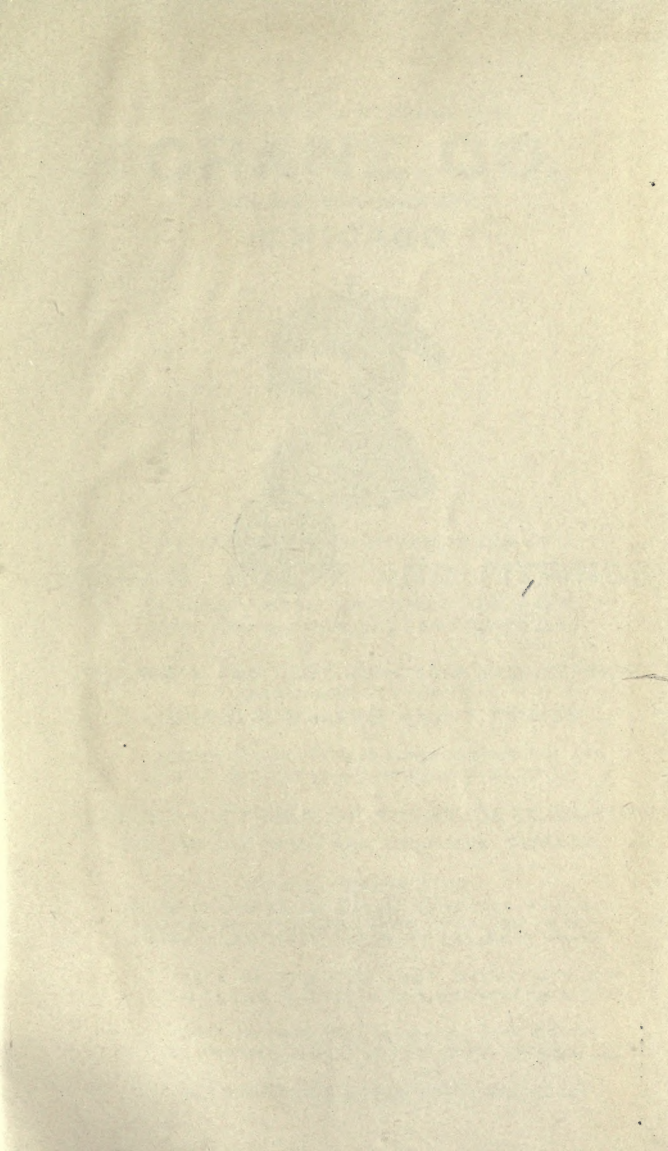






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FOUNDED BY R. T. CRANE, 1855

# CRANE CO.

836 SO. MICHIGAN AVE.

CHICAGO



WE MANUFACTURE A COMPLETE LINE OF  
**VALVES, COCKS AND FITTINGS**

IN BRASS, IRON, FERROSTEEL AND CAST  
STEEL FOR ALL PRESSURES AND PURPOSES

MALLEABLE AND CAST IRON SCREWED FITTINGS  
DRAINAGE FITTINGS  
HYDRAULIC VALVES AND FITTINGS

SIXTEEN THOUSAND FIVE HUNDRED ARTICLES FOR  
USE IN HANDLING STEAM, WATER, GAS, OIL, ETC.

**FLANGED FITTINGS OF EVERY DESCRIPTION**

PIPE FITTERS' TOOLS AND ENGINEERS' SUPPLIES

**STEAM SPECIALTIES**

AUTOMATIC STOP-CHECK VALVES, EMERGENCY, EXHAUST  
RELIEF AND BACK PRESSURE VALVES, STEAM AND OIL SEP-  
ARATORS, STEAM TRAPS, POP SAFETY AND RELIEF VALVES

CAST STEEL VALVES AND CAST STEEL FITTINGS  
ESPECIALLY CONSTRUCTED FOR SUPERHEATED STEAM

ESTIMATES FURNISHED FROM DRAWINGS SUBMITTED, ON  
COMPLETE PIPING EQUIPMENT, PIPE BENDS, ETC.

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F. W. KNAPP, 402 Boston Bldg., Denver, Col.  
T. K. McKNIGHT, 630 Oliver Bldg., Pittsburg, Penn.



## PREFACE

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This 1917 edition of the Complete Crane Catalogue lists the full line of Crane products and the goods have been classified, grouped and arranged in such a way that they may be easily located.

The Valves are grouped, first according to the material of which they are made, then the type of valve, and finally the working pressures.

The Fittings are first divided into screwed and flanged sections, then according to materials and their working pressures.

The catalogue numbers, with which the trade is more or less familiar, have been retained, but in the rearrangement they do not follow consecutively. There is, however, following the general index, a number index, the use of which will be an aid when looking for an article the number of which is known.

It is our constant aim to supply every need of the trade, and correspondence is solicited on any point not fully covered in this catalogue.

**CRANE CO.**

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## TERMS

Terms: Cash unless otherwise agreed upon.

Prices and Designs: Subject to change without notice.

Contracts subject to strikes, accidents or other causes beyond our control.

No claims allowed unless made within ten days of receipt of goods.

We guarantee Crane goods to the extent that we will replace those having manufacturing defects when used in the service for which we recommend them, but no goods are taken back unless our consent has first been obtained.

Orders covering special goods are not subject to cancellation, except upon agreement to make payment for special work which has been performed.

All tubular goods are carefully tested and inspected, but as it is impossible to always detect imperfections, the only guarantee that is given by us is to replace such goods as prove defective or allow credit for such goods, at our option. Under no circumstances are we responsible for any damages beyond the price of the goods. If goods appear defective, discontinue their use and notify us promptly so the matter may be investigated without delay.

Requests for cancellation of orders calling for odd sizes or cut lengths of pipe will not be considered if the manufacture of the material has been commenced when the request reaches the mill.

All special goods made to specification, where buyer is to inspect, must be inspected and accepted before shipment is made. After shipment is made our responsibility ceases.

No charges for labor or expense required to repair defective goods, or occasioned by them, will be allowed. If the goods are defective, the measure of the damage is the price of the defective goods only.

The carriers are responsible for goods lost, damaged or delayed in transit; therefore, as required in Section 3 of Uniform Bill of Lading conditions, in case of loss, damage or delay in transit, consignee must immediately notify the railroad agent at destination, in writing, sufficiently describing shipment and contents to enable railroad to identify it, in order to substantiate formal claim when presented. In case of shortage in, or damage to, goods, railroad agent should be required to make and sign notation to that effect on the freight bill.

Boxing and Cartage are charged at cost.



## DISTINGUISHING MARKS

The name—**CRANE**—is the adopted marking which will distinguish nearly all goods made by this Company.

Exceptions to the above marking are as follows:


Brass Goods such as Steam, Gas and Water Cocks are marked CC. Standard lines of Malleable and Cast Iron Screwed Fittings and Forged Steel Screwed Fittings are marked C.

Certain other goods such as Unions, Union Elbows and Tees, in addition to the mark C, have specific marking, viz.:

CHICAGO—RAILROAD—NAVY—ETC.

Cast Steel Valves and Cast Steel Flanged Fittings are marked

**CRANE**  
**STEEL**  


Cast Steel Screwed Fittings are marked with **CRANE** or C on one side and  on the other.

Forged Steel Valves have **CRANE** on the center piece and C on the body.

## MARKING WORKING PRESSURES

Respective pages in this catalogue representing various goods, specify the Working Pressures as applying either to the entire line (regardless of sizes) or mention the specific working pressure for which each size is recommended.

To further complete and perfect this system, all articles bearing the distinguishing mark—**CRANE**—will also have their respective Working Pressure plainly stamped or cast on each article, and is to be understood as meaning:

**THE STEAM WORKING PRESSURE FOR WHICH THEY ARE INTENDED.**

This marking should not be misconstrued to mean Water or Test Pressure, as, in the case of Water Valves or strictly Hydraulic Goods, the marking will designate the Water Working Pressure.

## IMPORTANT EXPLANATORY NOTICE WITH REFERENCE TO CHANGE IN MARKING

We formerly marked some of our Valves and Fittings, showing "TEST PRESSURES," but have concluded it best to mark them with the "WORKING PRESSURES" instead. For instance, Extra Heavy Valves and Fittings which were formerly marked **CRANE 800** (indicating test pressure) are now marked **CRANE 250**, meaning steam working pressure. This new marking does not in any respect alter the construction or affect the quality of the goods.

## PROPORTIONATE WATER WORKING PRESSURES

For convenience in determining the approximate or admissible Water Working Pressures to which Valves and Fittings may be subjected, proportionate to or based on the designated Steam Working Pressures, we suggest the following conservative rule, although a much greater range may be safely used with comparatively small sizes of Valves and Fittings:

Low Pressure, Standard and Medium Valves and Fittings will stand a Water Working Pressure 40 per cent greater than the Steam Working Pressure on sizes 12 inch and smaller; and sizes 14 inch and larger will stand 20 per cent greater Water Working Pressure.

The above also applies to Extra Heavy Globe Valves and Screwed Fittings and all Extra Heavy Goods larger than 8 inches.

Extra Heavy Gate Valves, Check Valves and Flanged Fittings will stand 400 pounds Water or Natural Gas Working Pressure on sizes 8 inch and smaller when temperature does not exceed 100° Fahrenheit.

## CRANE METALS

In order to insure a uniform and reliable product Crane Company maintains complete laboratories for making chemical, physical and metallographic analyses and tests of the materials which it uses. Daily analyses are made of the raw materials used, and the tensile and transverse strengths, ductility, etc., of Gray Iron, Ferrosteeel, Malleable Iron and Cast Steel are regularly determined. These results are recorded and furnish invaluable data for maintaining a uniform product.

Crane Company also has a special testing department in which investigations are conducted as to the merits of Crane goods to meet not only present requirements but also special conditions as they arise. Complete facilities are provided for duplicating almost any service to be met with, consequently recommendations made for our various lines of goods may be safely followed as they are based on actual performance.

We give below some of the characteristics of the metals regularly used in the articles illustrated on the following pages.

### CRANE HARD METAL

This is a pure copper-tin Bronze of great strength and hardness which years of satisfactory service have proved thoroughly reliable for valves and fittings for use with high pressures under extremely severe conditions. Its hardness and average tensile strength of 34,000 pounds per square inch make it an exceptionally desirable material for valves, valve seats and discs to withstand severe service.

### CRANE SPECIAL BRASS

Crane Special Brass is a high grade steam metal which has been found most desirable for use where conditions call for a superior valve metal, and in view of the satisfactory service which it has given to thousands of users we have no hesitation in recommending it.

### CRANE STEM METAL

To procure a metal to withstand the great torsional and tensile strains to which valve stems are subjected, Crane Company has developed "Crane Stem Metal" which is now used where "cast bronze" stems were formerly called for. This material has an average tensile strength of 55,000 pounds per square inch.

### CRANE GRAY IRON

Through constant application of scientific control in the choice of materials, their mixture and making into molten metal, Crane Company's Gray Iron has long been held to a high standard. It has an average tensile strength of 22,500 to 25,000 pounds per square inch. With this strength goes a uniformity and a softness which makes it particularly adaptable to the manufacture of Cast Iron Valves and Fittings.

### CRANE FERROSTEEL

This material, which is 50 per cent stronger than Gray Cast Iron, is regularly used for the larger sized valves and fittings in which close grain and strength are most needed. Its close grain makes it particularly valuable for lines which are to convey ammonia and other gases and high pressure steam.

### CRANE MALLEABLE IRON

Crane Malleable Iron has an average tensile strength of 37,000 pounds per square inch. By the application of improved methods in furnace practice, casting and annealing, we are able to offer a superior line of malleable iron goods.



As a part of our regular routine control in the production of malleable iron and the annealing of the articles made from it, we illustrate a torsional test bar, one of which is made half-hourly during each day's run.

## CRANE CAST STEEL VALVES AND FITTINGS

To meet the increasing demand for Valves and Fittings for the higher pressures, and for superheated steam, Crane Company has installed a fully equipped steel foundry.

By a combination of superior design, proper materials, chemical control and expert foundry and machine work, we have succeeded in turning out a product of superior quality.

### STANDARD REQUIREMENTS FOR HIGH GRADE STEEL CASTINGS

- 1.—Castings must be properly designed and proportioned with particular reference to the service intended.
- 2.—They must be sound and free from sponginess, shrinkage, blow, sand or gas holes.
- 3.—They should have a surface as smooth as possible.
- 4.—Ordinarily the metal from which they are poured, must comply with the following minimum requirements:

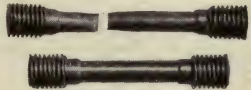
	Usual Requirements	Crane Cast Steel
Tensile Strength per square inch.....	60,000	62,000 to 85,000
Elastic Limit per square inch.....	30,000	35,000 to 45,000
Elongation in 2 inches.....	20%	20% to 25%
Reduction of Area.....	25%	25% to 35%
Cold Bend.....	90°	90° to 180°
Sulphur.....	.06%	Under .06%
Phosphorus.....	.05%	Under .05%



REQUIRED TEST



CRANE TEST



CRANE TENSILE TEST BAR  
BEFORE AND AFTER TEST

The 90° bend is required by leading Engineers. Our bars often stand a great deal more.

These cuts represent a bar of Cast Steel one inch square, bent cold without cracking or distress.

5.—Careful and accurate annealing is necessary to relieve cooling strains and remove brittleness. All Crane Steel Castings are annealed in furnaces fitted with recording pyrometers.

### MONEL METAL

Valve discs and seat rings must be made of a non-corrosive material, which has the same expansion and contraction as the metal of which the valve is made. Crane Cast Steel Valve seat and disc rings are made of Monel Metal which is highly non-corrosive and the highest grade metal known for this service. The rings will not loosen from the expansion and contraction of the metals under either saturated or superheated steam temperatures.

Extensive tensile and torsional tests, covering all temperatures met with in steam engineering practice, has demonstrated the great superiority of rolled Monel Metal as a material for stems. Its high resistance to corrosive influences and its high elastic limit under both tension and torsion, make it particularly serviceable and it is regularly furnished in Crane Cast Steel Valves.



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236 H	29	285	90	334	164	390	249	450½	77	521½	365
238 H	42	287 D	397	335	161	391	249	452	76	522	365
239 H	378	288	91	336	164	392	19	452½	77	523	365
240 H	366	289	93	337	164	392	248	453	78	523½	365
250	81	291 E	393	338	165	392½	19	458	53	525	420
251 D	402	292	92	339	166	392½	248	459	53	526	425
251 E	393	293 E	403	340	107	393	249	460	130	527	420
251 H	401	294	92	341	107	393½	249	461	130	528	425
252	81	295 E	405	341 BP	107	394	120	462	132	529	426
253 E	396	298	93	342	108	394½	119	462½	138	530	429
254	81	299 E	406	343	108	395	120	463	133	531	426
255 E	394			343 BP	108	395½	119	464	131	532	429
256	81			344	109	396½	250	464½	131	533	428
258	81	<b>300</b>	278	345	109	397	121	465	131	534	427
260	86	300 D	362	345 BP	109	398	279	465½	131	535	428
260 D	361	301 D	362	350	100	399½	250	467	139	536	427
260 H	360	302 D	362	351	100			469	134	537	431
261 E	403	304 D	362	352	101			470	135	538	424
262	86	305	84	353	101			471	135	539	431
262 D	361	306	84	354	103	<b>400</b>	<b>279</b>	472	136	540	424
262 H	360	306 D	362	355	103	401	280	473	136	541	430
263 H	360	307	84	356	103	403	280	475	137	543	430
264 D	361	308	85	357	103	404	278	475½	137	545	423
264 H	360	310	163	358	104	406	278	480	140	547	432
265	82	310 D	363	359	104	408	282	481	140	549	421
266	82	311	163	360	105	409	281	482	140	550	421
266 D	361	311 D	363	362	102	411	277	483	140	551	422
266 H	360	312 D	363	363	102	412	277	491	125	552	407
267 H	360	314 D	363	364	103	415	205	493	126	553	388
268	83	316	251	365	103	415 A	205	498	127	555	390
269	83	316 D	363	366	115	415 H	205			556	388
270	88	317	251	367	115	415 V	205			558	388
271 D	464	318	162	368	116	416	203			559	388
271 E	393	319	162	369	116	417	203	<b>500</b>	<b>143</b>	560	388
272	88	320	158	372	117	437	52	501	143	567	413
273 D	464	322	158	373	117	437½	52	503	143	569	413
275 D	465	324	158	374	117	438	44	504	144	571	416
276	88	325	159	374½	118	440	46	505	144	573	416
277 D	465	326	160	375	118	440½	47	507	144	575	417

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577	417	708	566			1014½	302	1069	319	1507	479
578	415	710	566			1015	302	<b>1101</b>	<b>232</b>	1507½	481
579	414	712	566			1015½	302			1508	491
580	414	714	566			1016	302			1509	480
581	418	720	567	908	547	1016½	302	1103	233	1509½	481
582	418	722	567	920	550	1017	303	1105	232	1510	491
585	354	724	567	924	550	1018	303	1107	233	1510½	482
586	354	730	560	927	552	1019	304	1116	235	1511	485
587	354	732	560	929	552	1020	305	1116A	236	1512	489
588	354	734	560	930	550	1021	305	1117	235	1513	486
589	354	736	560	940	549	1022	311	1117 A	236	1514	489
590	370	738	561	942	549	1023	311	1123	245	1515	487
591	370	740	561	944	549	1024	307	1123 A	246	1516	489
592	370	741	561	946	549	1025	307	1126	243	1517	488
593	370	742	567	948	549	1026	312	1127	243	1518	489
594	371	744	567	950	551	1027	312	1128	243	1519	485
595	371	750	576	952	551	1028	308	2230	244	1519¼	487
596	371	751	576	954	551	1029	308	1132	243	1519½	486
597	371	752	576	962	213	1030	309	1134	243	1519¾	488
598	373	753	576	963	213	1031	309	1138	243	1520	496
<b>600</b>	572	<b>800</b>	544	971	210	1032	310	1144	227	1521	492
				972	210	1033	310	1145	227	1522	496
				973	210	1034	313	1146	227	1523	493
				974	210	1035	313	1148	227	1526	496
				975	210	1036	313	1149	227	1527	495
602	572	802	545	990	217	1037	314	1150	227	1530	497
604	573	804	94	991	571	1038	314	1152	225	1532	497
606	573	806	94	993	221	1039	315	1158	225	1534	497
607½	574	812	95	995	221	1046	304	1160	223	1538	497
608	572	814	95	<b>1000</b>	<b>299</b>	1047	300	1162	223	1539	497
610	557	816	97			1048	310	1165	224	1540	497
613	559	820	96			1049	315	1165 V	70	1542	497
615	559	822	96			1050	306	1180	239	1544	502
616	558	830	98			1051	306	1181	239	1545	499
624	556	833	98	1001	300	1052	306	1182	239	1547	499
650	582	834	98	1002	299	1053	306	1183	239	1549	500
652	582	835	98	1003	299	1054	306	<b>1500</b>	<b>491</b>	1551	500
668	577	836	98	1004	300	1055	306			1553	502
670	577	842	98	1005	299	1056	300			1554	500
672	577	844	98	1006	299	1057	300	1501	474	1555	504
680	581	846	98	1007	299	1058	300	1502	491	1557	504
682	581	850	553	1008	301	1059	315	1503	475	1559	505
<b>700</b>	566	852	553	1009	301	1060	319	1504	476	1561	505
		854	553	1010	301	1062	319	1504½	477	1562	506
		856	553	1011	301	1064	319	1505	476	1564	506
		858	553	1012	302	1066	318	1505½	477	1570	507
		860	553	1013	302						



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1575 $\frac{3}{4}$	516	1581 $\frac{1}{2}$	512	1587	520	1595	523	1811	24		
1576	516	1582	503	1588	518	1596	525	1812	25		

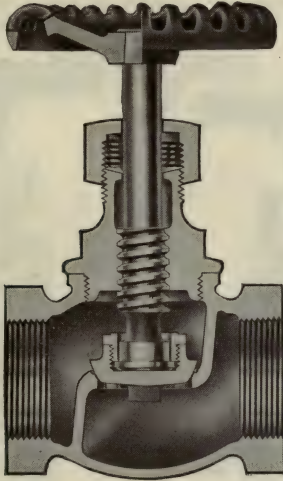
CRANE CO.

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## NOTES

## STANDARD BRASS VALVES

GLOBE ANGLE, CROSS AND CHECK



### MERITS OF STANDARD BRASS VALVES

These Valves are well proportioned, are of good weight, and sufficiently strong to stand the steam working pressures as given on the following pages.

They are thoroughly tested under steam pressure before leaving the factory.

The question is constantly being raised as to what material in Valves and weight of Valves are suitable for the different pressures that are used in engineering practice. In many cases ordinary Standard Valves are used for high pressures and there is no doubt they are sufficiently strong to stand the working pressures, as we have at various times subjected them to a hydraulic pressure of 500 to 1000 pounds without leaking; but, as stated above, we do not recommend them for more than the steam working pressure as specified on the following pages.

It is not only a question of the Valves standing a higher pressure, but, also standing the strain of expansion, contraction, weight of piping and settling, also the cutting effect of the steam on the disc and seat.

It is, however, possible that the Standard Valves might be reasonably satisfactory for higher working pressures, provided the expansion, contraction, weight of piping and settling were all taken care of.

The construction of the Standard Globe and Angle Valves is such that they may be packed when open, without steam escaping. To do so, have Valve wide open.

All users of Valves will appreciate the advantage in being able to repack a Valve without shutting off steam, as it frequently happens that it is necessary they be run continuously.

# STANDARD BRASS GLOBE, ANGLE AND CROSS VALVES

FOR STEAM WORKING PRESSURES

SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 3½ AND 4 INCH, UP TO 100 POUNDS



No. 1 GLOBE



No. 2 ANGLE

Size.....Inches	⅛	¼	⅜	½	¾	1	1¼
No. 1, Globe.....Each	.72	.72	.77	1.00	1.26	1.80	2.52
No. 2, Angle.....Each	.72	.72	.77	1.00	1.26	1.80	2.52
No. 18, Cross.....Each		1.25	1.25	1.50	2.00	2.50	3.50
Size.....Inches	1½	2	2½	3	3½	4	
No. 1, Globe.....Each	3.50	5.30	10.00	14.40	26.50	36.00	
No. 2, Angle.....Each	3.50	5.30	10.00	14.40	26.50	36.00	
No. 18, Cross.....Each	5.00	8.00	16.00	24.00			

FOR DESCRIPTION OF THESE VALVES, SEE PAGE 1

## BETA GLOBE AND ANGLE VALVES

Size.....Inches	⅜	½	¾	1	1¼	1½	2
Globe or Angle.....Each	.77	1.00	1.26	1.80	2.52	3.50	5.30

Although these Valves are lighter than our No. 1 and No. 2 Standard Valves, they are equal in weight to many Standard Valves of other manufacture.

Unless otherwise ordered, Standard Globe and Angle Valves will be supplied.



# STANDARD BRASS GLOBE AND ANGLE VALVES

FOR STEAM WORKING PRESSURES

SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 3½ AND 4 INCH, UP TO 100 POUNDS



No. 3

FLANGED

Size.....Inches	¾	1	1¼	1½	2
Price.....Each	5.00	6.75	8.50	10.50	16.00
Center to Face, Flanged, Angle...Inches	2¼	2½	2⅞	3⅜	3¾
Face to Face, Flanged, Globe....Inches	3¼	3⅝	4⅞	4⅝	5½
Diameter of Flanges.....Inches	3½	4	4½	5	6
Size.....Inches	2½	3	3½	4	
Price.....Each	23.00	35.00	50.00	70.00	
Center to Face, Flanged, Angle...Inches	4⅝	4⅝	5¼	5½	
Face to Face, Flanged, Globe....Inches	6⅞	7½	7⅞	8⅞	
Diameter of Flanges.....Inches	7	7½	8½	9	

These Valves may be packed while under pressure; to do so, have Valve wide open.

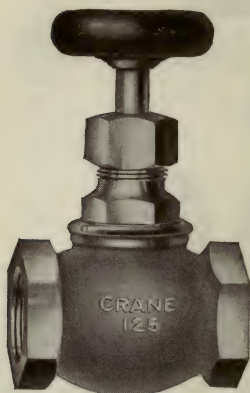
In ordering, be particular to specify whether Globe or Angle.

Templates for drilling, page 649. Price List for drilling, page 141.

# STANDARD GLOBE AND ANGLE VALVES

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 6



No. 8

## No. 6. WOOD WHEEL

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough Body, Plain .....	Each	1.15	1.25	1.40	1.75	2.35	3.25	4.35	6.85
Price, Rough Body, Plated all over .....	Each	1.40	1.55	1.70	2.10	2.75	3.70	4.85	7.60
Price, Finished all over .....	Each	1.85	2.00	2.15	2.50	3.25	4.35	5.75	9.00
Price, Finished and Plated all over .....	Each	2.15	2.30	2.45	2.85	3.65	4.80	6.25	9.75

## No. 8. WITH FINISHED BRASS WHEEL

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Finished all over .....	Each	2.75	3.00	3.15	3.50	4.25	5.60	7.00	10.25
Price, Finished and Plated all over .....	Each	3.25	3.50	3.70	4.10	4.90	6.30	7.75	11.25

These Valves are made to order only.

They may be packed while under pressure; to do so, have Valve wide open.

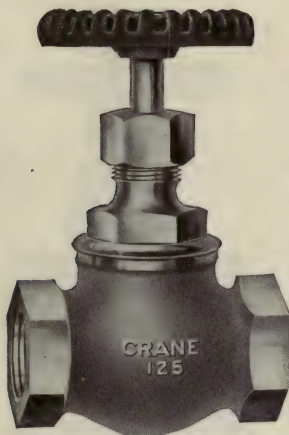
When ordering, specify whether Globe or Angle pattern is wanted, giving Valve number, size, and style of finish.

# JENKINS DISC GLOBE AND ANGLE VALVES

BRASS

WITH NON-HEATING WHEEL

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 12

Size .....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
No. 12, Screwed ... Each	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
No. 13, Flanged ... Each				5.00	6.00	9.00	11.00	16.50	25.00	34.00
Diam. Flanges ..Inches				3½	4	4½	5	6	7	7½

These Valves may be packed while under pressure; to do so, have Valve wide open.

When Valves are wanted for cold water, they will be furnished with Jenkins Soft Disc at same price.

These Valves made to order with metallic disc, suitable for steam, at a special price.

Valves for air will be furnished with Jenkins Soft Disc at a special price.

When ordering, state whether Globe or Angle Valves are wanted.

Flanged Valves made to order only.

Templates for drilling, page 649. Price List for drilling, page 141.

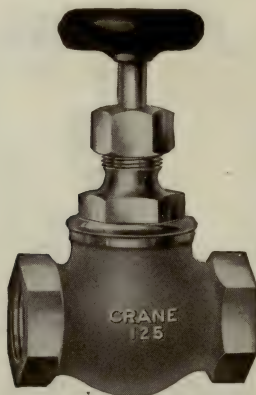
## EXTRA JENKINS DISCS

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price.....Each	.06	.08	.08	.10	.12	.18	.24	.36	.48	.80

# JENKINS DISC GLOBE AND ANGLE VALVES

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**NO. 14. WOOD WHEEL**

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough Body, Plain.....	Each	2.00	2.50	3.20	4.50	6.25	10.50
Price, Rough Body, Plated all over.....	Each	2.40	2.90	3.60	4.90	6.65	10.90
Price, Finished all over.....	Each	2.50	3.00	3.75	5.25	7.25	11.75
Price, Finished and Plated all over.....	Each	2.90	3.40	4.15	5.65	7.65	12.15

**NO. 16. WITH FINISHED BRASS WHEEL**

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Finished all over.....	Each	3.50	4.00	4.75	6.50	8.50	13.00
Price, Finished and Plated all over.....	Each	4.15	4.65	5.40	7.15	9.15	13.65

These Valves are made to order only.

They may be packed while under pressure; to do so, have Valve wide open.

The center piece is so constructed as to prevent the packing and nut from turning when opening or closing the Valve.

When Valves are wanted for cold water, they will be furnished with Jenkins Soft Disc, at same price.

Valves for air will be furnished with Jenkins Soft Disc at a special price.

When ordering, specify whether Globe or Angle Valves are wanted, giving Valve number, size, and style of finish.



## STANDARD GLOBE AND ANGLE VALVES

BRASS

WITH BRITISH STANDARD THREADS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 15, without Gland... Each		.72	.77	1.00	1.35	1.80	2.80	3.90	5.90	11.25	16.00
No. 15 $\frac{1}{2}$ , with Gland... Each		.85	.95	1.20	1.50	2.00	3.10	4.30	6.50	12.40	17.60

## STANDARD GLOBE AND ANGLE VALVES

BRASS

WITH BRITISH STANDARD THREADS

LEATHER DISCS

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 17, without Gland... Each		.85	.95	1.20	1.50	2.00	3.10	4.30	6.50	12.40	17.60
No. 17 $\frac{1}{2}$ , with Gland... Each		1.00	1.15	1.40	1.65	2.20	3.40	4.70	7.10		

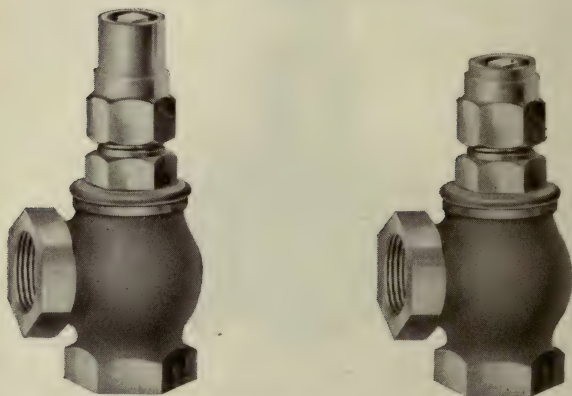
In ordering, be particular to specify whether Globe or Angle Valves are wanted.

## SPECIAL LOCK AND SHIELD GLOBE AND ANGLE VALVES

BRASS

FOR NATURAL GAS

BRASS DISC



No. 48

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Rough Body, Plain.....Each	1.10	1.35	1.60	2.25	3.25
Price, Rough Body, Plated all over. Each	1.40	1.65	1.95	2.65	3.70

These Valves with fibre disc made to order at a special price.

Nickel Plated Valves are made to order only.

We will also make to order, Valves with short Stem and short Shield and Valves with short Stem and without Shield, at a special price.

These Valves are packed ready for use.

The disc is ground to its seat, insuring a tight joint.

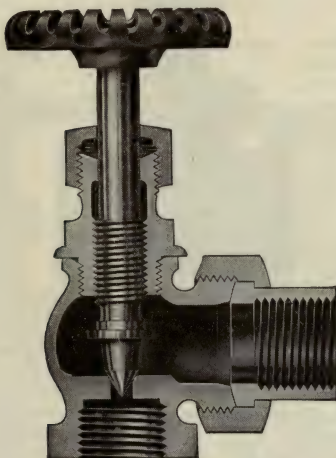
Extra for Keys, see page 68.

# SPECIAL GLOBE AND ANGLE VALVES NEEDLE POINT

BRASS

WITH NON-HEATING WHEEL

FOR WORKING PRESSURES UP TO 125 POUNDS



**No. 60, ANGLE, WITH UNION**

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Size Feed Opening.....Inches	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$
Price, Globe, Female Openings... Each	1.20	1.40	1.50	2.00	2.50
Price, Angle, Female Openings... Each	1.20	1.40	1.50	2.00	2.50
Price, Angle, with Union..... Each	2.00	2.00	2.20	3.00	3.50

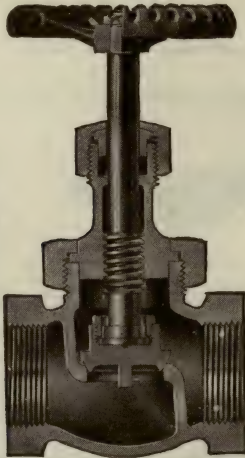
These Valves are used for regulating fuel oil feed, and are made to order only.

In ordering, state size of opening for feed; otherwise will furnish as above. Also state whether Globe or Angle, and with Female Openings or with Union.

**CRANE NAVY VALVES****UNION BONNET****REGRINDING****GLOBE, ANGLE, CROSS AND  
CHECK VALVES****CRANE SPECIAL BRASS****WITH GLAND**

Fitted with Our  
Improved Non-Heating  
Malleable Iron  
Wheel

These Valves  
May be Packed when  
Wide Open  
and Under Pressure

**No. 70. GLOBE PATTERN**

All the brass parts of these Valves are made of "Crane Special Brass," the merits of which are described on page B.

For marine service, a Valve which can be reground while in place is almost indispensable, and Valves of this type are universally used in the Navy. This style Valve, however, offers just as many advantages to all steam users, as, apart from the regrinding feature, it is the strongest form which can be adopted. The body is reinforced by a heavy union ring, and when pressure is applied, any tendency of the body to stretch is counteracted by this ring, and the contact between the body and ring becomes more intimate as the pressure increases.

**INSTRUCTIONS FOR REGRINDING**

Unscrew the union ring, take out the trimmings, insert a wire or nail through the hole in disc, which locks it with the stem so that both turn together; put fine emery and a little oil on the disc, replace the trimmings, leaving the large nut or union ring loose enough to turn the trimmings in body; regrind by rotating the trimmings until a tight joint bearing is formed on the seat and disc. The hub on center piece, which also rotates in the body, guides the stem while regrinding.



# CRANE NAVY VALVES

UNION BONNET

REGRINDING

## GLOBE, ANGLE AND CROSS VALVES

CRANE SPECIAL BRASS

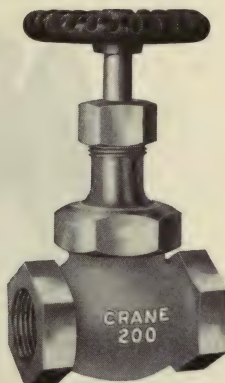
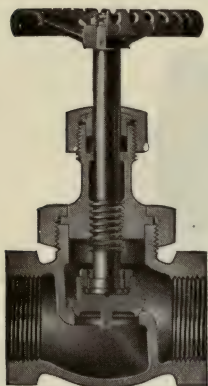
NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES

SIZES  $1\frac{1}{4}$  INCH AND SMALLER, UP TO 225 POUNDSSIZES  $1\frac{1}{2}$  TO 3 INCH, INCLUSIVE, UP TO 200 POUNDSSIZES  $3\frac{1}{2}$  AND 4 INCH, UP TO 175 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 70, Globe or Angle, Scrw'd. Each	1.30	1.50	1.90	2.50	3.50	5.00
No. 74, Cross, Screwed.....Each			2.65	3.50	4.75	6.00
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 70, Globe or Angle, Scrw'd. Each	7.00	11.00	20.00	29.00	45.00	65.00
No. 74, Cross, Screwed.....Each	9.00	14.00	28.00	42.00		

For description and directions for regrinding, see page 10.

In ordering, state whether Globe, Angle or Cross Valves are wanted.

# CRANE NAVY VALVES

UNION BONNET

REGRINDING

## GLOBE, ANGLE AND CROSS VALVES

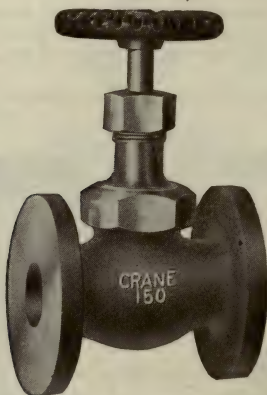
CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 71 FLANGED

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 71, Globe or Angle, Flg'd...Each				6.00	8.00	11.00
No. 75, Cross, Flanged.....Each				9.25	12.25	17.00
Diameter of Flanges.....Inches				$3\frac{1}{2}$	4	$4\frac{1}{2}$
Face to Face, Globe, Flanged...Inches				$3\frac{1}{8}$	$4\frac{3}{16}$	$4\frac{9}{16}$
Center to Inlet or Outlet, Angle, Flanged..Inches				$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{7}{8}$
Face to Face, Cross, Flanged...Inches				$4\frac{1}{2}$	5	$5\frac{3}{4}$
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 71, Globe or Angle, Flg'd....Each	14.00	20.00	33.00	48.00	65.00	90.00
No. 75, Cross, Flanged.....Each	23.00	33.00	48.00	72.00		
Diameter of Flanges.....Inches	5	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9
Face to Face, Globe, Flanged...Inches	$5\frac{5}{16}$	6	$6\frac{3}{4}$	$7\frac{1}{8}$	$8\frac{7}{8}$	$9\frac{5}{8}$
Center to Inlet or Outlet, Angle, Flanged..Inches	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{5}{16}$	$4\frac{5}{8}$	$5\frac{1}{4}$	$5\frac{1}{2}$
Face to Face, Cross, Flanged..Inches	$6\frac{3}{8}$	$7\frac{1}{2}$	$8\frac{5}{8}$	$9\frac{1}{4}$	$10\frac{1}{2}$	11

For description and directions for regrinding, see page 10.

Templates for drilling, page 649. Price List for drilling, page 141.

In ordering, state whether Globe, Angle or Cross Valves are wanted.

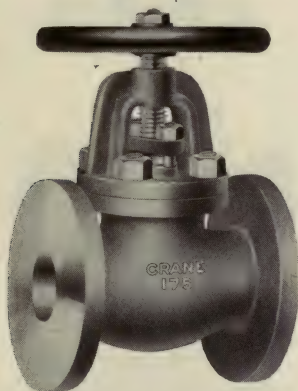
**MEDIUM**  
**GLOBE AND ANGLE VALVES**  
**FOR MARINE SERVICE**

BOLTED YOKE

RENEWABLE SEAT

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

**No. 77**

Size.....Inches	2½	3
No. 76, Screwed, Globe or Angle.....Each	32.00	42.00
No. 77, Flanged, Globe or Angle.....Each	45.00	60.00

These Valves comply with the requirements of the Board of Supervising Inspectors, Department of Commerce, Steamboat Inspection Service.

In ordering be sure to specify whether Globe or Angle.

Templates for drilling, page 649. Price List for drilling, page 141.

# HARD METAL GLOBE AND ANGLE VALVES

EXTRA HEAVY

WITH NON-HEATING WHEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 4

Size....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price....Each	1.30	1.50	1.90	2.50	3.50	5.00	7.00	11.00	20.00	29.00

These Valves are much heavier than the ordinary Brass Valve; the body and disc are made of "Hard Metal" which is almost as hard as Steel and successfully resists the cutting effects of steam and water. The trimmings are made of "Crane Special Brass." The merits of these metals are further described on page B.

These Valves have withstood the hardest tests on extreme pressures and severe service and are particularly recommended where exceptionally strong and durable Valves are required.

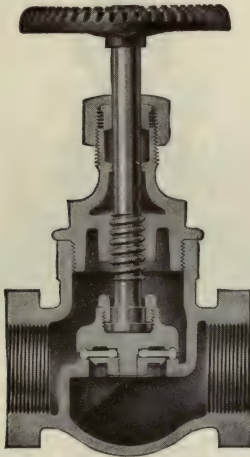
They may be packed while under pressure; to do so, have Valve wide open.

Sizes  $\frac{3}{4}$  inch and larger have a gland.

In ordering, be particular to specify whether Globe or Angle Valves are wanted.



**COPPER DISC  
EXTRA HEAVY  
GLOBE AND ANGLE VALVES**

**CRANE SPECIAL BRASS****NON-HEATING WHEEL****WITH GLAND****FOR STEAM WORKING PRESSURES UP TO 250 POUNDS****TESTED TO 800 POUNDS HYDRAULIC PRESSURE**

**No. 60 E GLOBE**

The Crane Copper Disc has successfully overcome the many objections found in some types of hard rubber or composition discs.

The construction of the disc and holder is such that the disc may be easily taken out and replaced.

When so ordered these Valves are supplied with a brass swivel having a ground joint.

These Valves may be packed when wide open and under pressure.

These Valves can be furnished with Hard Metal Body and Disc as illustrated on page 27.

# COPPER DISC EXTRA HEAVY GLOBE AND ANGLE VALVES

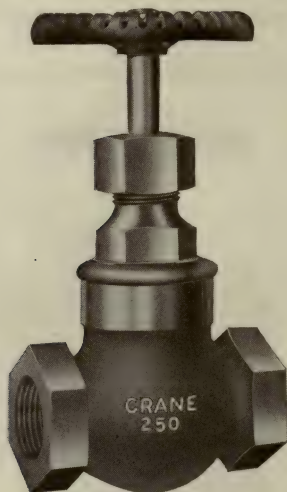
CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 60 E GLOBE

Size . . . . . Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 60 E, Screwed Each	3.25	3.75	4.25	5.50	7.75	10.00	15.00	27.50	38.50
No. 61 E, Flanged Each				11.00	15.00	21.00	28.00	45.00	68.00
Diam. of Flanges . . . . . Inches				$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$
Face to Face, Globe, Flg'd Inches				$4\frac{1}{16}$	$4\frac{1}{2}$	$5\frac{3}{16}$	$6\frac{3}{16}$	$7\frac{7}{16}$	$8\frac{7}{8}$
Center to Face, Angle, Flg'd Inches				$2\frac{15}{16}$	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{1}{16}$	$4\frac{11}{16}$	$5\frac{1}{2}$

## EXTRA COPPER DISCS

Size . . . . . Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price . . . . . Each	.08	.08	.10	.12	.18	.24	.36	.48	.80

In ordering, state whether Globe or Angle are wanted.

An extra price is charged for Drilling Flanged Valves.

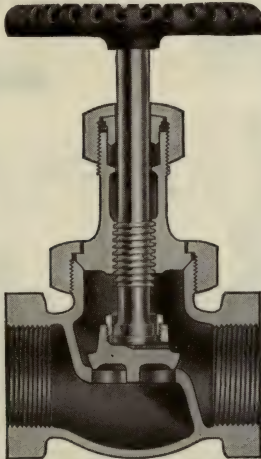
Templates for drilling, page 649. Price List for drilling, page 152.

**EXTRA HEAVY  
REGRINDING — UNION BONNET  
GLOBE, ANGLE, CROSS  
AND CHECK VALVES**

CRANE SPECIAL BRASS

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

**No. 82 E GLOBE PATTERN**

Sizes 2 inch and smaller are fitted with Non-Heating Wheel.

These Valves may be packed, when wide open and under pressure.

All the brass parts of these Valves are made of "Crane Special Brass," the merits of which are described on page B.

For marine service, a Valve which can be reground while in place is almost indispensable, and Valves of this type are universally used in the Navy. This style Valve, however, offers just as many advantages to all steam users, as, apart from the regrinding feature, it is the strongest form which can be adopted. The body is reinforced by a heavy union ring, and when pressure is applied, any tendency of the body to stretch is counteracted by this ring, and the contact between the body and ring becomes more intimate as the pressure increases.

**INSTRUCTIONS FOR REGRINDING**

Unscrew the union ring, take out the trimmings, insert a wire or nail through the hole in disc, which locks it with the stem so that both turn together; put fine emery and a little oil on the disc, replace the trimmings, leaving the large nut or union ring loose enough to turn the trimmings in body; regrind by rotating the trimmings until a tight joint bearing is formed on the seat and disc. The hub on center piece, which also rotates in the body, guides the stem while regrinding.

# EXTRA HEAVY REGRINDING—UNION BONNET GLOBE, ANGLE AND CROSS VALVES

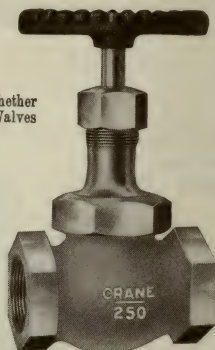
CRANE SPECIAL BRASS

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



In ordering, state whether  
Globe, Angle or Cross Valves  
are wanted.



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 82 E, Globe or Angle, Screwed..Each	1.30	1.50	1.90	2.50	3.50	5.00
No. 83 E, Globe or Angle, Flanged..Each				6.00	8.00	11.00
No. 90 E, Cross, Screwed.....Each			2.65	3.50	4.75	6.00
No. 91 E, Cross, Flanged.....Each				9.25	12.25	17.00
Diam. of Flanges.....Inches				4	$4\frac{1}{2}$	5
Face to Face, Globe, Flanged..Inches			$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{3}{8}$	$4\frac{1}{2}$
Center to Inlet or Outlet, Angle, Flanged...Inches			$2\frac{1}{8}$	$2\frac{9}{16}$	$2\frac{7}{8}$	$3\frac{1}{8}$
Face to Face, Cross, Flanged..Inches			$4\frac{5}{8}$	$5\frac{1}{8}$	$5\frac{3}{4}$	$6\frac{1}{4}$
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 82 E, Globe or Angle, Screwed..Each	7.00	11.00	20.00	29.00	45.00	65.00
No. 83 E, Globe or Angle, Flanged..Each	14.00	20.00	33.00	48.00	65.00	90.00
No. 90 E, Cross, Screwed.....Each	9.00	14.00	28.00	42.00		
No. 91 E, Cross, Flanged.....Each	23.00	33.00	48.00	72.00		
Diam. of Flanges.....Inches	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	9	10
Face to Face, Globe, Flanged..Inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{5}{8}$	$8\frac{3}{8}$	$9\frac{1}{2}$	$10\frac{5}{8}$
Center to Inlet or Outlet, Angle, Flanged...Inches	$3\frac{3}{4}$	$4\frac{1}{16}$	$4\frac{9}{16}$	$5\frac{1}{16}$	$5\frac{9}{16}$	$6\frac{3}{4}$
Face to Face, Cross, Flanged..Inches	$7\frac{1}{2}$	$8\frac{3}{8}$	$9\frac{1}{8}$	$10\frac{1}{8}$	$11\frac{1}{8}$	$12\frac{7}{16}$

For description and directions for regrinding, see page 17.

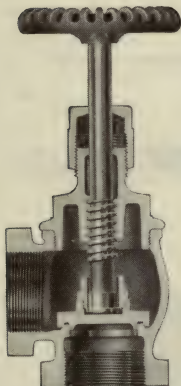
Templates for drilling, page 649. Price List for drilling, page 152.



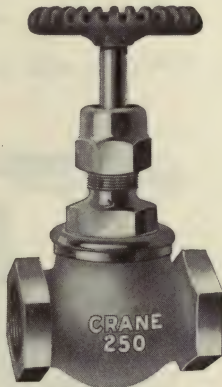
# EXTRA HEAVY HARD METAL GLOBE AND ANGLE VALVES

SCREWED—WITH NON-HEATING WHEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 392 ANGLE



No. 392½ GLOBE

Size . . . . . Inches	¾	1	1¼	1½	2	2½
Price, Globe or Angle . . . . . Each	2.50	3.50	5.00	7.00	10.00	20.00

Unless otherwise ordered, the Angle Pattern will be furnished.

## DESCRIPTION

The body and disc of these Valves are made of Hard Metal which is almost as hard as steel and successfully resists the cutting effects of scale, etc.

All other brass parts are made of "Crane Special Brass"; the merits of these metals are described on page B.

We recommend these Valves for use as Blow-Offs on small high pressure Boilers and all other purposes where it is desirable to blow-off dirty water, or water containing grit or sediment under pressure.

We call particular attention to the construction of the disc and seat in these Valves.

# EXTRA HEAVY GLOBE AND ANGLE VALVES

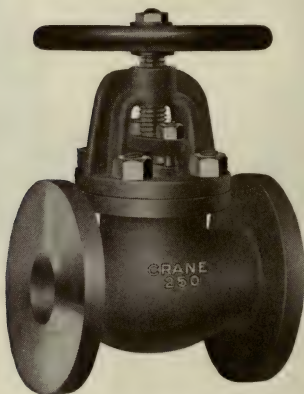
BOLTED YOKE

RENEWABLE SEAT

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR MARINE SERVICE



No. 87 E

Size.....	Inches	2½	3
No. 85 E, Screwed, Globe or Angle.....	Each	40.00	58.00
No. 87 E, Flanged, Globe or Angle.....	Each	60.00	88.00

These Valves comply with the requirements of the Board of Supervising Inspectors, Department of Commerce, Steamboat Inspection Service.

In ordering be sure to specify whether Globe or Angle.

Templates for drilling, page 649. Price List for drilling, page 152.

# EXTRA HEAVY FROST VALVE

UNION BONNET

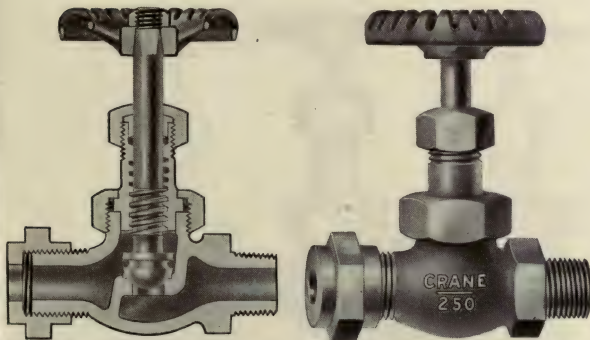
REGRINDING

CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1800

MALE INLET, UNION NUT ON OUTLET

Size.....	Inches	$\frac{3}{8}$
Price.....	Each	2.00

These Valves have found extensive service on Locomotives, in draining the delivery pipe between the Injector and Boiler Check, also the Water Glass and for Bell Ringer Throttles.

They are also used in each water connection of the Journal Cooling System.

# LOCOMOTIVE CAB HOSE SPRINKLER VALVE

UNION BONNET

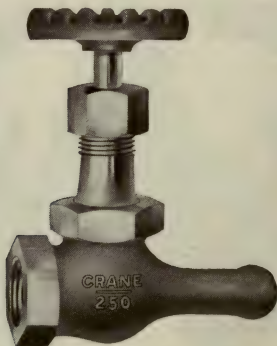
REGRINDING

CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1801

FEMALE INLET, HOSE END OUTLET

Size of Inlet . . . . .	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Size of Hose . . . . .	Inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
Price . . . . .	Each	2.35	2.75	2.75

The value of a regular Hose End Valve, as compared with the usual method of clamping to an ordinary nipple, where there is danger of the hose slipping off, will be appreciated by Engineers and Firemen who have had experiences with scalding.

# EXTRA HEAVY GLOBE AND ANGLE VALVES

UNION BONNET

REGRINDING

CRANE SPECIAL BRASS

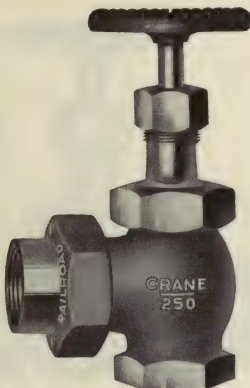
NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1805

FEMALE INLET, FEMALE UNION OUTLET  
WITH MALLEABLE NUT

No. 1813

FEMALE INLET, FEMALE UNION OUTLET  
WITH MALLEABLE NUT

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Nos. 1805 and 1813..Each	2.25	2.25	3.00	4.00	5.75	7.75	10.50	17.00

These Valves are especially recommended for Locomotive Service.



# EXTRA HEAVY GLOBE AND ANGLE VALVES.

UNION BONNET

REGRINDING

CRANE SPECIAL BRASS

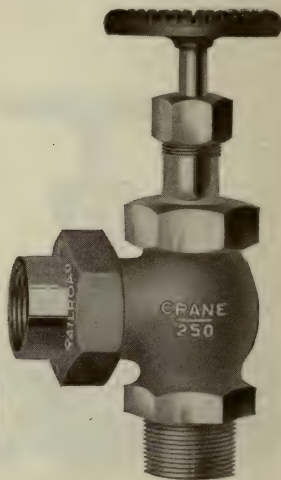
NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1803

MALE INLET, FEMALE UNION OUTLET  
WITH MALLEABLE NUT

No. 1811

MALE INLET, FEMALE UNION OUTLET  
WITH MALLEABLE NUT

Size . . . . . Inches	$\frac{3}{8} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$2\frac{1}{2} \times 3$
Nos. 1803 and 1811. Each	2.40	2.60	3.60	4.90	7.35	9.50	13.00	20.50	38.00

These Valves are especially recommended for Locomotive Service.

The Male inlet end is one pipe size larger than the Female union outlet end.

The size of the Valve is governed by the size of the union outlet.

# EXTRA HEAVY ANGLE VALVES

CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1812

MALE INLET, FEMALE UNION OUTLET WITH BRASS RING

Size.....Inches	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$
Price.....Each	10.00	12.00	16.00	21.00	30.00

These are exceptionally large and heavily built Valves throughout and are recommended for Locomotive Service.

The Male inlet end is one pipe size larger than the Female union outlet end.

The size of the Valve is governed by the size of the union outlet.

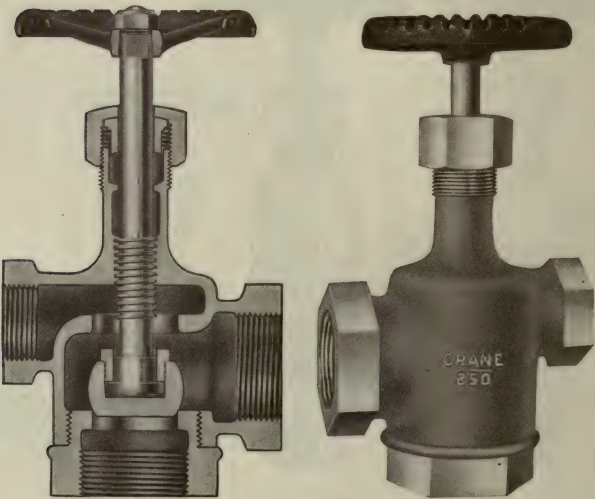
EXTRA HEAVY  
THREE-WAY VALVE

CRANE SPECIAL BRASS

NON-HEATING WHEEL

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1810

1½ INCH FEMALE INLET, 1 AND 1½ INCH FEMALE OUTLETS

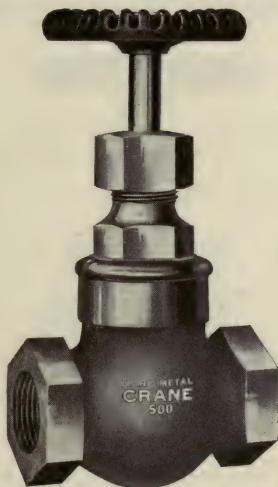
Size .....	Inches	1½×1×1½
Price .....	Each	15.00

These Valves are especially recommended for Locomotive Service.

# EXTRA HEAVY GLOBE AND ANGLE VALVES HARD METAL

RECOMMENDED FOR

COLD WATER WORKING PRESSURES UP TO 500 POUNDS HYDROSTATIC  
250 POUNDS SUPERHEATED STEAM WITH TOTAL TEMPERATURE OF 700° FAHR.



No. 228 H

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Globe or Angle.....Each	3.75	4.25	5.50	7.75	10.00	15.00

## WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

In ordering, state whether Globe or Angle Valves are wanted.

THE BODY AND DISC OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS (EXCEPT WHEEL) ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

These Valves may be packed when wide open and under pressure.

# EXTRA HEAVY HYDRAULIC GLOBE AND ANGLE VALVES

HARD METAL

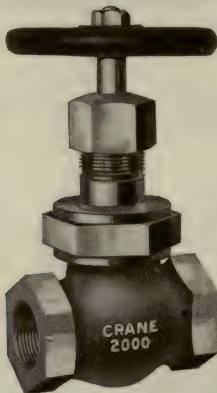
WITH GLAND

FOR COLD WATER OR OIL WORKING PRESSURES

SIZES 1 INCH AND SMALLER, UP TO 2000 POUNDS HYDROSTATIC

SIZE 1 1/4 INCH, UP TO 1500 POUNDS HYDROSTATIC

THESE VALVES ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING  
TO THE ABOVE WORKING PRESSURES



No. 232 H  
WITH GLAND

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Globe or Angle.....Each	6.00	6.00	7.00	9.00	13.00

## WORKING PRESSURES

These Valves are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

The diameter of the seat opening of these Valves is approximately the same as the inside diameter of Double Extra Strong Pipe.

In ordering, state whether Globe or Angle Valves are wanted.

THE BODY AND DISC OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS (EXCEPT WHEEL) ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

These Valves may be packed when wide open and under pressure.

When larger sizes are wanted we recommend No. 236 H Bolted Bonnet Valves, shown on page 29.



# EXTRA HEAVY HYDRAULIC GLOBE VALVES

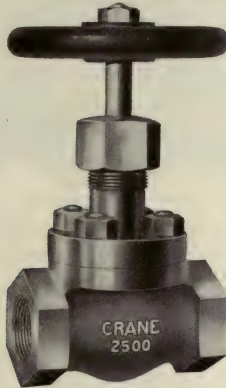
## BOLTED BONNET

HARD METAL

WITH GLAND

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
2500 POUNDS HYDROSTATIC

TESTED TO 2500 POUNDS HYDRAULIC PRESSURE



No. 236 H

Size.....Inches	1	1¼	1½	2	2½
Price.....Each	22.50	27.50	35.00	47.50	90.00

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

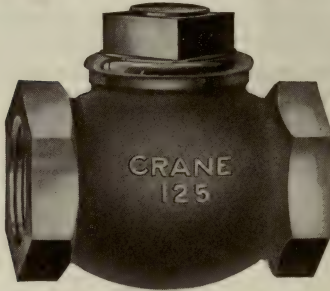
The diameter of the seat opening of these Valves is approximately the same as the inside diameter of Double Extra Strong Pipe.

THE BODY AND DISC OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS (EXCEPT STUDS, NUTS AND WHEEL) ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

These Valves may be packed when wide open and under pressure.

When larger sizes are wanted we recommend our Extra Heavy Hydraulic Cast Steel Gate Valves shown on pages 180 and 181.

**STANDARD BRASS  
HORIZONTAL CHECK VALVES  
FOR STEAM WORKING PRESSURES  
SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS  
SIZES 3½ AND 4 INCH, UP TO 100 POUNDS**



**No. 20**

Size.....Inches	1/8*	1/4*	3/8*	1/2	3/4	1	1¼
No. 20, Screwed.....Each	.65	.65	.70	.90	1.15	1.60	2.25
No. 21, Flanged.....Each					4.90	6.50	8.25
Diameter of Flanges.....Inches					3½	4	4½
Size.....Inches	1½	2	2½	3	3½	4	
No. 20, Screwed.....Each	3.15	4.75	9.00	13.00	24.00	32.50	
No. 21, Flanged.....Each	10.15	15.50	22.00	33.50	47.50	66.50	
Diameter of Flanges.....Inches	5	6	7	7½	8½	9	

\*These sizes are ball pattern.

Templates for drilling, page 649. Price List for drilling, page 141.

**JENKINS DISC  
HORIZONTAL CHECK VALVES  
BRASS**

**FOR STEAM WORKING PRESSURES UP TO 125 POUNDS**

Size.....Inches	¼	¾	½	¾	1	1¼	1½	2	2½	3
No. 22, Screwed.....Each	1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	13.50	20.50
No. 23, Flanged.....Each				4.75	5.50	7.80	9.80	15.00	22.80	32.40
Diam. Flanges.....Inches				3½	4	4½	5	6	7	7½

Flanged Valves made to order only at a special discount.

Templates for drilling, page 649. Price List for drilling, page 141.

**BETA HORIZONTAL CHECK VALVES**

Size.....Inches	¾	½	¾	1	1¼	1½	2
Price.....Each	.70	.90	1.15	1.60	2.25	3.15	4.75

Although these Check Valves are lighter than our No. 20 Standard Check Valves they are equal in weight to many Standard Valves of other manufacture.

Standard Horizontal Check Valves will be supplied, unless otherwise specified.

Templates for drilling, page 649. Price List for drilling, page 141.

STANDARD CHECK VALVES

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 24



No. 26

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, No. 24, Vertical..	Each	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30		
Price, No. 26, Angle ....	Each	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40

HORIZONTAL CHECK VALVES

BRASS

WITH DRIP COCK

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 28

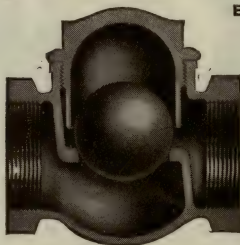
Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 28, with Drip Cock .....	Each	2.15	2.55	3.15	4.05
No. 30, without Drip Cock .....	Each	1.85	2.20	2.70	3.60

## HORIZONTAL CHECK VALVES

BRASS

BALL CHECK PATTERN

For Steam Working Pres-  
sures up to 125 Pounds



Furnished with Drip Cock  
at an Extra Price

No. 31

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	1.60	2.30	3.10	4.00	6.20	9.40

For smaller sizes of Ball Check Valves, see No. 20, page 30. which are provided with balls, sizes  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ .



## FOOT VALVES

BRASS

No. 33

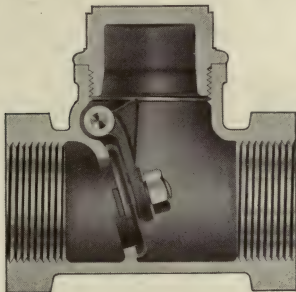
WITH STRAINER

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....Each	1.50	1.50	2.00	2.75
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	3.75	5.50	12.00	16.00

# STANDARD SWING CHECK VALVES

BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

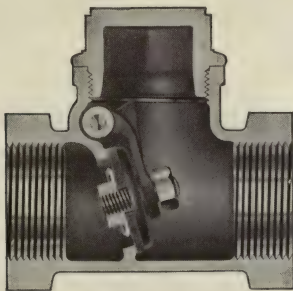


No. 34

MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 34, Brass Disc.....Each	1.80	2.00	2.25	2.80	3.65	4.75	6.75	15.00	24.00

FOR WATER WORKING PRESSURES UP TO 175 POUNDS



No. 34 $\frac{1}{2}$

MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 34 $\frac{1}{2}$ , Leather Disc... Each	2.40	2.65	2.90	3.60	4.65	6.00	8.25		



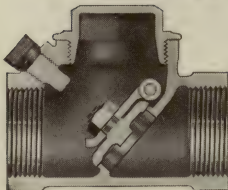
# MEDIUM SWING CHECK VALVES

BRASS

FOR STEAM WORKING PRESSURES

SIZES 2 INCH AND SMALLER, 200 POUNDS

SIZES 2½ AND 3 INCH, 150 POUNDS

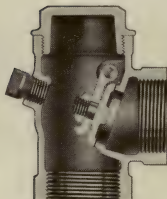


No. 35

MAY BE USED IN A HORIZONTAL POSITION OR  
FOR UPWARD FLOW

Size.....Inches	¼	⅜	½	¾	1
No. 35, Horizontal Scrw'd. Ea.	2.50	2.50	2.75	3.10	4.00
Size.....Inches	1¼	1½	2	2½	3
No. 35, Horizontal Scrw'd. Ea.	5.50	7.00	10.00	19.00	27.00

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

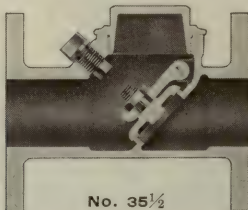


No. 37 ANGLE

Size.....Inches	½	¾	1	1¼
No. 37, Angle Screwed... Each	2.75	3.10	4.00	5.50
Size.....Inches	1½	2	2½	3
No. 37, Angle Screwed... Each	7.00	10.00	19.00	27.00

Flanged Angle Swing Check Valves made to  
order at a special price.

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 35½

MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	¾	1	1¼	1½	2	2½	3
No. 35½, Horizontal Flanged. Each	10.00	12.50	17.00	21.00	35.00	50.00	65.00
Face to Face.....Inches	4⅞	5	5⅞	6⅞	7⅞	8½	9⅞
Diameter of Flanges...Inches	3½	4	4½	5	6	7	7½

Templates for drilling, page 649. Price List for drilling, page 141.

## CRANE NAVY VALVES

UNION BONNET

REGRINDING

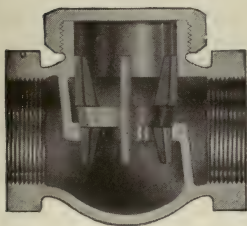
### HORIZONTAL AND ANGLE CHECK VALVES

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES

SIZES  $1\frac{1}{4}$  INCH AND SMALLER, UP TO 225 POUNDS  
 SIZES  $1\frac{1}{2}$  TO 3 INCH, INCLUSIVE, UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 72, Screwed.....Each	1.15	1.35	1.70	2.25	3.15
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 72, Screwed.....Each	4.50	6.30	9.90	18.00	26.00

In ordering, give Valve number and state whether Horizontal or Angle.

#### INSTRUCTIONS FOR REGRINDING

Unscrew the large nut or cap and take out disc; put fine emery and a little oil on disc; replace the disc and rotate forward and backward until a tight joint is formed.

# CRANE NAVY VALVES

UNION BONNET

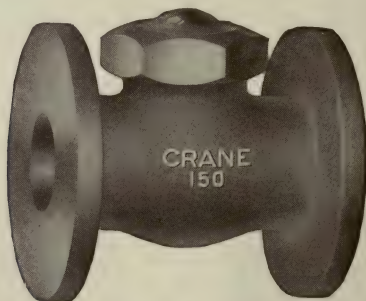
REGRINDING

## HORIZONTAL AND ANGLE CHECK VALVES

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 73 FLANGED

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 73, Flanged.....Each				5.00	7.00
Diameter of Flanges.....Inches				$3\frac{1}{2}$	4
Face to Face, Horizontal, Flanged Inches				$3\frac{1}{16}$	$4\frac{3}{16}$
Center to Inlet or Outlet, Angle, Flanged....Inches				$2\frac{1}{4}$	$2\frac{1}{2}$
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 73, Flanged.....Each	10.00	13.00	18.00	30.00	43.00
Diameter of Flanges.....Inches	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$
Face to Face, Horizontal, Flanged Inches	$4\frac{9}{16}$	$5\frac{5}{16}$	6	$6\frac{3}{4}$	$7\frac{15}{16}$
Center to Inlet or Outlet, Angle, Flanged....Inches	$2\frac{7}{8}$	$3\frac{3}{16}$	$3\frac{3}{4}$	$4\frac{5}{16}$	$4\frac{5}{8}$

In ordering, give Valve number and state whether Horizontal or Angle.

For directions for regrinding, see page 35.

Templates for drilling, page 649. Price List for drilling, page 141.

## EXTRA HEAVY SWING CHECK VALVES

CRANE SPECIAL BRASS

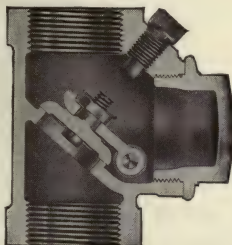
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE

### HORIZONTAL



### UPWARD FLOW



No. 74 E

Size . . . . . Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 74 E, Screwed . . . . . Each	3.25	3.25	4.25	6.00	7.50	12.00	25.00
No. 75 E, Flanged . . . . . Each			13.00	18.00	22.00	37.50	55.00
Diameter of Flanges . Inches			$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$

ALL PARTS OF THESE VALVES ARE MADE OF "CRANE SPECIAL BRASS," THE MERITS OF WHICH ARE FULLY DESCRIBED ON PAGE B

These Valves can be furnished with Hard Metal Body and Disc, as illustrated on page 38.

Templates for drilling, page 649. Price List for drilling, page 152.

# EXTRA HEAVY REGRINDING SWING CHECK VALVES HARD METAL

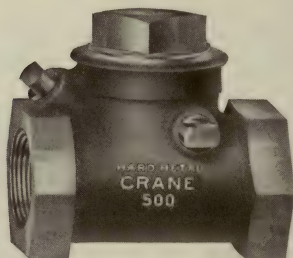
RECOMMENDED FOR

350 POUNDS SATURATED STEAM

250 POUNDS SUPERHEATED STEAM WITH TOTAL TEMPERATURE OF 700° FAHR.

COLD WATER WORKING PRESSURES UP TO 500 POUNDS HYDROSTATIC

TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 78 E

MAY BE USED IN A HORIZONTAL LINE OR FOR UPWARD FLOW

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	4.25	5.00	6.50	8.50	11.50	17.50

## WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

THE BODY AND DISC OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

## DIRECTIONS FOR REGRINDING

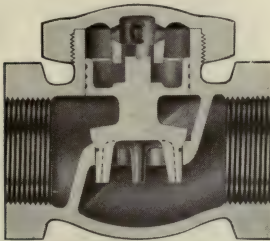
Remove cap and stop-plug, raise disc, and place a small quantity of grindstone dust moistened with soap and water on seat, lower disc into place. Insert a screw-driver through stop-plug opening, until point engages with slot in clapper-stud. Rotate disc until a new surface has been secured.



**EXTRA HEAVY**  
**REGRINDING—UNION BONNET**  
**HORIZONTAL CHECK VALVES**

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 92 E

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 92 E, Screwed.....Each	1.15	1.35	1.70	2.25	3.15
No. 93 E, Flanged.....Each				5.00	7.00
Diameter of Flanges.....Inches				4	$4\frac{1}{2}$
Face to Face, Flanged.....Inches			$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{3}{8}$
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 92 E, Screwed.....Each	4.50	6.30	9.90	18.00	26.00
No. 93 E, Flanged.....Each	10.00	13.00	18.00	30.00	43.00
Diameter of Flanges.....Inches	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$
Face to Face, Flanged.....Inches	$4\frac{13}{16}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{5}{8}$	$8\frac{3}{8}$

**INSTRUCTIONS FOR REGRINDING**

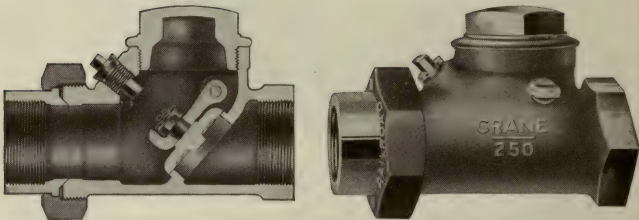
Unscrew the large nut or cap and take out disc; put fine emery and a little oil on disc; replace the disc and rotate forward and backward until a tight joint is formed.

Templates for drilling, page 649. Price List for drilling, page 152..

EXTRA HEAVY  
REGRINDING SWING CHECK VALVES

CRANE SPECIAL BRASS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 1820

MAY BE USED IN A HORIZONTAL POSITION OR FOR UPWARD FLOW

FEMALE INLET, FEMALE UNION OUTLET WITH MALLEABLE NUT

Size.....	Inches	1½	2
Price.....	Each	14.00	20.00

These Valves are especially recommended for Locomotive Service.

# EXTRA HEAVY HYDRAULIC CHECK VALVES

HARD METAL

FOR COLD WATER OR OIL WORKING PRESSURES

SIZES 1 INCH AND SMALLER, UP TO 2000 POUNDS HYDROSTATIC  
SIZE 1¼ INCH, UP TO 1500 POUNDS HYDROSTATIC

THESE VALVES ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING  
TO THE ABOVE WORKING PRESSURES



No. 234 H  
HORIZONTAL

Size.....	Inches	¾	½	¾	1	1¼
Price.....	Each	5.00	5.00	6.00	8.00	11.00

## WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

The diameter of the seat opening of these Valves is approximately the same as the inside diameter of Double Extra Strong Pipe.

THE BODY AND DISC OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

**EXTRA HEAVY HYDRAULIC  
CHECK VALVES**

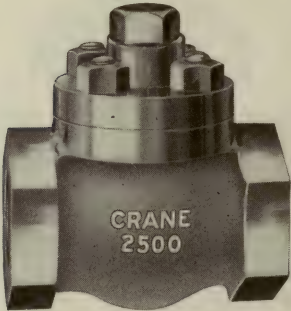
**HARD METAL**

**BOLTED BONNET**

**HORIZONTAL, SCREWED**

**FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
2500 POUNDS HYDROSTATIC**

**TESTED TO 2500 POUNDS HYDRAULIC PRESSURE**



**No. 238 H**

Size.....	Inches	1	1¼	1½	2
Price.....	Each	18.00	22.50	27.50	40.00

**WORKING PRESSURES**

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

**AIR OR GAS**

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

THE BODY AND FEATHER OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS (EXCEPT STUDS AND NUTS) ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

The diameter of the seat opening of these Valves is approximately the inside diameter of Double Extra Strong Pipe.

## STANDARD GATE VALVES

**BRASS****WITH GLAND****WEDGE GATE****OPEN TO THE LEFT****NON-RISING STEM****(NEW PATTERN)**

### MERITS OF BRASS WEDGE GATE VALVES

The No. 438 Standard Gate Valves have been redesigned and improved throughout. They are well proportioned, of good weight, and are suitable for steam working pressures up to 125 pounds. Each Valve is thoroughly tested under steam pressure before leaving the factory.

We have subjected these Valves to hydraulic pressures ranging from 500 to 1,000 pounds, without leaking, but do not recommend them for more than the steam working pressure specified, as it is not only a question of the Valves withstanding the higher pressures, but also the strain of expansion and contraction, the weight of piping, settling, and the cutting effects of the steam on the discs and seats.

It is possible, however, that these Standard Valves might be reasonably satisfactory for higher working pressures, providing the expansion and contraction, the weight of piping and settling were all taken care of; still the cutting effects of the steam would render them less serviceable than the Valves which we recommend for higher pressures.

The construction of No. 438 Valves is such that they may be repacked under pressure, when wide open, without steam escaping.

All users of Valves appreciate the convenience of repacking without shutting off steam, as it is often necessary that the Valves be in service continuously.

The guides on the discs and the ribs in the bodies of these Valves are accurately fitted, which insures true and easy movement, prevents wear of the faces, and also prevents the discs from touching the seats in the bodies except at the point of closing.



# STANDARD GATE VALVES

BRASS

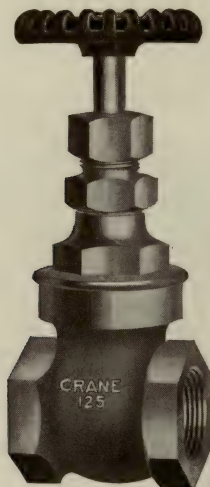
WITH GLAND

WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 438

Size . . . . . Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price . . . . . Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00
Weight . . . . . Pounds	.75	.75	1.05	1.65	2.40	3.70	5.00	7.33	12.50	18.25

These Valves have been designed for general service and are recommended with fullest confidence for use wherever Wedge Gate Valves are required.

The weight of each size as given in the above table is as light as this type of Valve should be made, and is an important feature which should always be considered when making comparisons with similar, but much lighter Valves of other manufacture.

## **STANDARD BRASS GATE VALVES**

**BRASS SEATS****DOUBLE GATE****RISING STEM**

### **MERITS OF BRASS DOUBLE GATE VALVES**

The Standard Double Disc (Double Gate) Valves have been in the market for many years, and to the best of our knowledge have given general satisfaction.

We do not recommend them for more than the steam working pressures as specified on the following pages.

They are tested under steam pressure, and we have at various times subjected the No. 440 Valves to a hydraulic pressure of 400 to 700 pounds, and the No. 440½ Valves to a hydraulic pressure of 500 to 1,000 pounds, without leaking, but, as stated above, we do not recommend them for more than the steam working pressures, as specified.

It is not only a question of the Valves standing a higher pressure, but also standing the strain of expansion, contraction, weight of piping and settling, also the cutting effect of the steam on the discs and seats.

It is, however, possible that these Standard Valves might be reasonably satisfactory for higher working pressures, provided the expansion, contraction, weight of piping and settling were all taken care of.

Still, the cutting effect of the steam would render these Valves less durable than the Valves which we recommend elsewhere in this book for higher pressures of steam.

STANDARD  
GATE VALVES

BRASS

DOUBLE GATE

OPEN TO THE LEFT

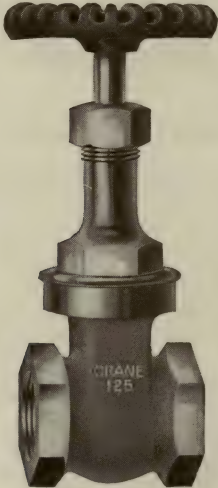
BRASS SEATS

RISEING STEM

FOR STEAM WORKING PRESSURES

SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 3½ INCH AND LARGER, UP TO 100 POUNDS



No. 440

Size.....Inches	¼	⅜	½	¾	1	1¼	1½
No. 440, Screwed.....Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00
Size.....Inches	2	2½	3	3½	4	5	6
No. 440, Screwed.....Each	7.30	13.00	19.00	43.00	58.00	110.00	165.00
No. 441, Flanged.....Each	25.00	33.00	39.00	68.00	83.00	135.00	190.00
Diameter of Flanges..Inches	6	7	7½	8½	9	10	11
Face to Face, Flanged.Inches	5½	6	6½	6¾	7	9¼	10¾

Note.—The 3½ to 6 inch Valves have flanged bonnet, non-rising stems, and are made to order.

These Valves are constructed with Parallel Seats and the bearing of the Wedge being central, it acts uniformly on all parts of the discs; consequently, it will force the discs to their seats and have an equal bearing on all parts.

Templates for drilling, page 649. Price List for drilling, page 141.

# STANDARD GATE VALVES

BRASS

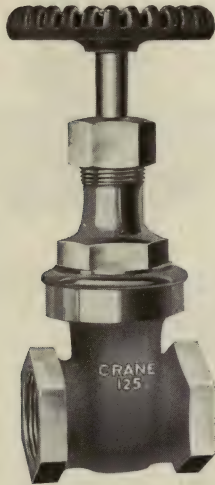
DOUBLE WEDGE GATE

OPEN TO THE LEFT

BRASS SEATS

RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 440 $\frac{1}{2}$ 

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price .....	Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00

These Valves are a heavier type than the No. 440 Valves. They are made with Taper instead of Parallel Seats and the self-adjusting Discs which have their bearings near the outer edge, give maximum strength at these essential points and bring the discs tightly and uniformly to their seats.

## STANDARD GATE VALVES

BRASS

DOUBLE GATE

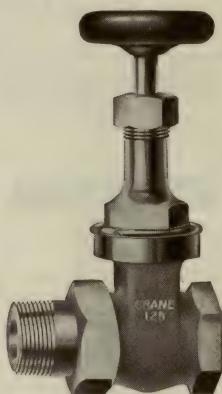
OPEN TO THE LEFT

RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 444



No. 446



No. 448

### No. 444 WOOD WHEEL

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough Body, Plain...Each	2.00	2.55	3.40	4.50	6.00	8.90
Price, Rough Body, Plated all over.....Each	2.40	3.00	3.85	5.00	6.60	9.65
Price, Finished all over.....Each	3.30	4.00	5.10	6.75	9.00	13.90
Price, Finished and Plated all over.....Each	3.70	4.50	5.60	7.35	9.70	14.80

### No. 446 WOOD WHEEL WITH UNION

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough Body, Plain...Each	3.20	3.75	4.65	6.00	8.25	11.90
Price, Rough Body, Plated all over.....Each	3.65	4.25	5.20	6.60	9.00	12.80

### No. 448 FINISHED BRASS WHEEL

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Rough Body, Plain...Each	2.90	3.30	4.65	5.85	7.60	10.60	16.70	24.30
Price, Finished all over...Each	4.15	4.80	6.35	8.10	10.60	15.60	24.00	35.00
Price, Finished and Plated all over...Each	4.60	5.30	6.95	8.80	11.40	16.50	25.25	36.75

These Valves are made to order only.

Can be furnished with Lock and Shield when so ordered, at a special price.

These Valves are the same type as the No. 440 Valves shown page 46.



# SLIDING STEM GATE VALVES

BRASS

DOUBLE GATE

QUICK OPENING

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 442

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 442, Screwed.....Each	3.60	4.80	6.20	8.50	11.80	20.25	30.00

These Valves are of a heavy pattern and, like No. 440, have parallel seats.

The winged nut at top of stem, locks the disc at any desired opening.

# STANDARD GATE VALVES

BRASS

DOUBLE WEDGE GATE

QUICK OPENING

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 442 $\frac{1}{2}$ 

WITH TAPER SEATS

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 442 $\frac{1}{2}$ , Screwed.....Each	3.60	4.80	6.20	8.50	11.80	20.25	30.00

These Valves are so constructed that the discs can not bind or stick when installed in any position. These Valves are made screwed only.

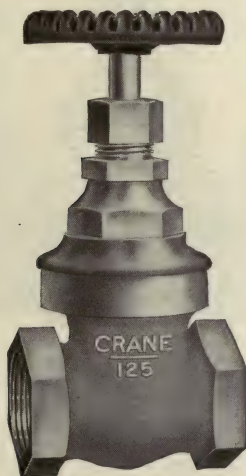
# STANDARD BRASS GATE VALVES

DOUBLE DISC

PARALLEL SEAT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 449

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	2.05	2.80	3.70	5.00	7.30	13.00	19.00

Flanged Valves, also Valves with British Standard Threads, will be made to order at special prices, according to sizes and quantities required.

# HEAVY STANDARD GATE VALVES

BRASS

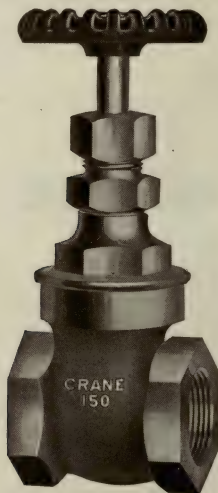
WITH GLAND

WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 437

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 437, Screwed...Each	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00
No. 437 $\frac{1}{2}$ , Flanged...Each					10.25	12.00	15.00	25.00	33.00	39.00
Face to Face, Flanged...Ins.					$3\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{3}{8}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$
Diameter of Flanges...Inches					4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

May be packed while under pressure; to do so have Valve wide open.

To our extensive line of Valves the No. 437 and No. 437 $\frac{1}{2}$  Heavy Standard Gate Valves have been added. These are of ampler proportions and greater weight than Standard Valves.

We have subjected these Valves to hydraulic pressures ranging from 700 to 3,000 pounds, with Valves closed and pressure against the discs, without leaking, and with Valves open we have tested the bodies to pressures ranging from 1,000 to 3,000 pounds without leaking, but they are not recommended for more than the working pressure specified as it is not only a question of the Valves withstanding the higher pressures, but also the strain of expansion and contraction, the weight of piping, settling, and the cutting effects of the steam on the seats and disc.

Templates for drilling, page 649. Price List for drilling, page 141.

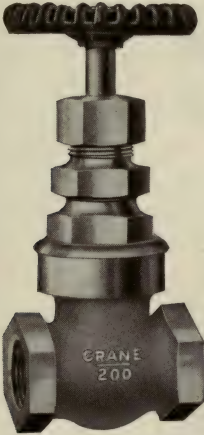
## MEDIUM GATE VALVE

CRANE SPECIAL BRASS

WEDGE GATE

WITH GLAND

FOR STEAM WORKING PRESSURES UP TO 200 POUNDS



**NO. 458. NON-RISING STEM,  
SCREWED**



**NO. 459. RISING STEM, SCREWED  
WITH OUTSIDE SCREW AND YOKE**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 458, Screwed...Each	2.75	3.25	4.50	6.00	8.00	13.00	20.00	32.50
No. 459, Screwed...Each		8.75	10.25	12.00	15.00	22.00	32.00	

The No. 458 Non-Rising Stem Valves are of a heavy pattern, but otherwise they are similar in construction to our No. 438 Straight-Way Wedge Gate Valves, as shown and described on pages 43 and 44.

They may be packed while under pressure; to do so, have Valve wide open.

The No. 459 with Outside Screw and Yoke and Rising Stem is the type of Valve approved by the Underwriters and required by many local governments, on certain classes of work. They will come into general use when their merits are recognized.



## EXTRA HEAVY GATE VALVES

CRANE SPECIAL BRASS

WITH GLAND

WEDGE GATE

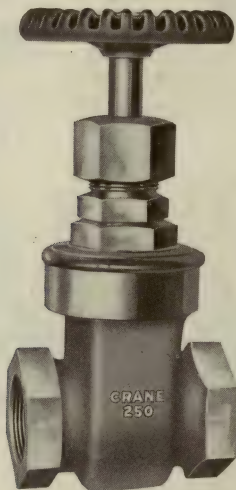
OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE

FOR WATER WORKING PRESSURES UP TO 350 POUNDS



No. 66 E

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 66 E, Screwed, Each	4.00	5.00	6.00	8.00	11.25	16.50	23.00	40.00	65.00
No. 67 E, Flanged, Each				16.00	21.50	30.00	41.00	65.00	100.00
Diam. Flanges..Inches				$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$
Face to Face Flanged...Inches				$4\frac{5}{16}$	$4\frac{9}{16}$	$5\frac{5}{16}$	$6\frac{3}{16}$	$7\frac{1}{8}$	$8\frac{3}{16}$

THESE VALVES ARE MADE EXTRA HEAVY IN ALL PARTS AND ARE ESPECIALLY DESIGNED FOR EXTREME HIGH PRESSURE STEAM WORK. ALL OF THE BRASS PARTS ARE MADE OF "CRANE SPECIAL BRASS," THE MERITS OF WHICH ARE FULLY DESCRIBED ON PAGE B.

These Valves can be furnished with Hard Metal Body and Wedge Gate, as illustrated on page 56.

These Valves may be packed when wide open and under pressure.

Templates for drilling, page 649. Price List for drilling, page 152.

## EXTRA HEAVY GATE VALVES

CRANE SPECIAL BRASS

WITH GLAND

WEDGE GATE

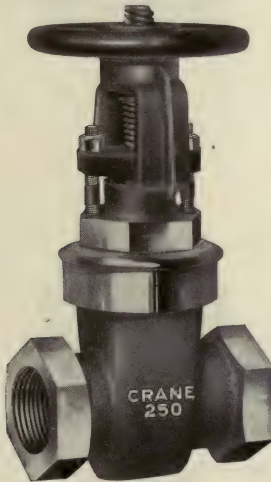
OPEN TO LEFT

OUTSIDE SCREW AND YOKE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS AND A  
TOTAL TEMPERATURE OF 500° FAHRENHEIT

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES UP TO 350 POUNDS



No. 68 E

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 68 E, Screwed.....Each	10.00	13.00	17.00	23.00	35.00
No. 69 E, Flanged.....Each	16.00	21.00	27.00	39.00	55.00

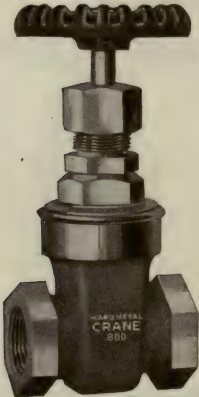
Gate Valves with outside screw and yoke and rising stem are being more generally used as their merits are becoming recognized. This type of Valve has been approved by the Underwriters and is required by many local governments on certain classes of work.

Templates for drilling, page 649. Price List for drilling, page 152.

EXTRA HEAVY HYDRAULIC  
GATE VALVES

HARD METAL                      WITH GLAND                      WEDGE GATE  
OPEN TO THE LEFT                      NON-RISING STEM

RECOMMENDED FOR  
350 POUNDS SATURATED STEAM  
250 POUNDS SUPERHEATED STEAM WITH TOTAL TEMPERATURE OF 700° FAHR.  
FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
800 POUNDS HYDROSTATIC  
TESTED TO 800 POUNDS HYDRAULIC PRESSURE



No. 230 H

Size.....	Inches	1/2	3/4	1	1 1/4	1 1/2	2
Price.....	Each	7.50	9.00	12.00	15.50	22.50	34.50

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

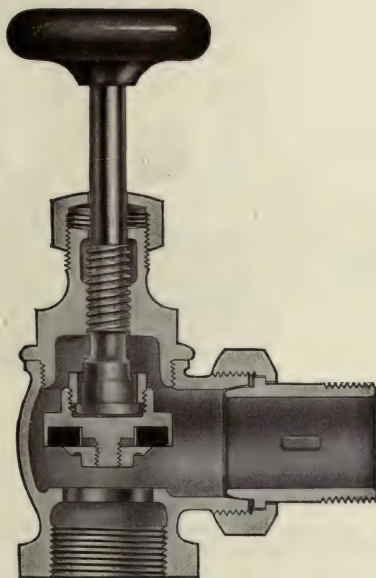
AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

THE BODY AND WEDGE GATE OF THESE VALVES ARE MADE OF "HARD METAL." ALL OTHER PARTS (EXCEPT WHEEL) ARE MADE OF "CRANE SPECIAL BRASS." THE MERITS OF THESE METALS ARE FULLY DESCRIBED ON PAGE B.

These Valves may be packed when wide open and under pressure. When larger sizes are wanted we recommend our Extra Heavy Hydraulic Ferrosteel Gate Valves, as shown on page 156.

**RADIATOR VALVES**  
**FOR**  
**STEAM AND HOT WATER**



ON THE FOLLOWING PAGES WE ILLUSTRATE A FULL VARIETY OF  
RADIATOR VALVES, WHICH WE BELIEVE IS SUFFICIENT TO MEET  
ALL REQUIREMENTS OF THE TRADE.

**RADIATOR VALVES**  
**WITH COMPOSITION DISCS**  
**WOOD WHEEL**



**No. 112**  
**WITH UNION**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 112, Rough Body, Plated all over.. Each	3.15	3.80	4.75	6.40	8.10	13.10

We do not furnish the above Valves with Female Outlet. Finished and Finished and Plated Valves will be made to order at a special price.

These Valves will satisfactorily answer the purpose where the jobs are small and the steam pressure is low. Still, for the small difference in cost, we recommend the use of our Standard Valve, which is heavier and is really a good article.

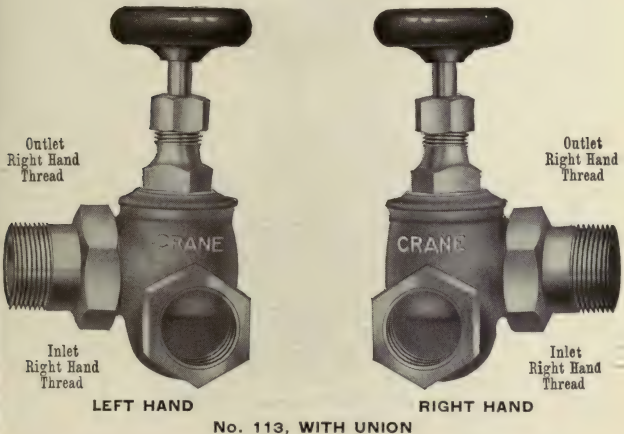
The Disc Holder in these Valves is the size of Jenkins Standard Disc, and is so constructed that the Disc may readily be replaced.



# CORNER RADIATOR VALVES

WITH COMPOSITION DISCS

WOOD WHEEL



Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 113, Rough Body Plated all over... Each	3.45	4.20	5.25	7.05	8.95	14.45

We do not furnish the above Valves with Female Outlet. Finished and Finished and Plated Valves will be made to order at a special price. In ordering Corner Radiator Valves, state whether Right Hand or Left Hand Valves are wanted. Both openings have right hand thread.

These Valves will satisfactorily answer the purpose where the jobs are small and the steam pressure is low. Still, for the small difference in cost, we recommend the use of our Standard Valve, which is heavier and is really a good article.

The Disc Holder in these Valves is the size of Jenkins Standard Disc, and is so constructed that the Disc may readily be replaced.

STANDARD RADIATOR VALVES

WITH JENKINS STANDARD DISC

WOOD WHEEL

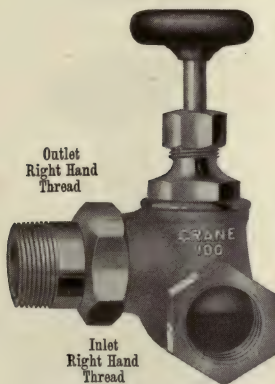


Nos. 124, 126 AND 128  
WITH UNION

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 124, Rough Body, Plated all over . . . . . Each	3.90	4.70	6.25	8.15	13.00
No. 126, Finished all over . . . . . Each	4.00	4.80	6.40	8.75	13.85
No. 128, Finished and Plated all over . . . . . Each	4.40	5.20	6.80	9.15	14.25

To facilitate ordering: Simply state size and number; the number sufficiently indicates the style and finish.

Finished Valves and Finished and Plated Valves are made to order only.

**STANDARD CORNER RADIATOR VALVES****WITH JENKINS STANDARD DISC****WOOD WHEEL****LEFT HAND VALVE****WITH UNION****Nos. 144, 146 AND 148**

Size..... Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 144, Rough Body, Plated all over.... Each	3.45	4.25	5.15	6.95	8.95	14.25
No. 146, Finished all over ..... Each	3.60	4.40	5.30	7.05	9.65	15.25
No. 148, Finished and Plated all over... Each	3.90	4.80	5.70	7.45	10.05	15.65

**THESE VALVES ARE MADE RIGHT HAND AND LEFT HAND AS SHOWN****PAGE 59**

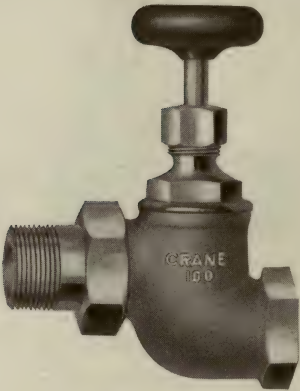
In ordering, always give Valve numbers and sizes, and state whether Right Hand or Left Hand Valves are wanted.

Finished Valves and Finished and Plated Valves are made to order only.

STANDARD OFFSET RADIATOR VALVES

WITH JENKINS STANDARD DISC

WOOD WHEEL



Nos. 164, 166 AND 168, WITH UNION OUTLET

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 164, Rough Body, Plated all over. Each	4.25	5.15	6.95	8.95	14.25
No. 166, Finished all over.....Each	4.40	5.30	7.05	9.65	15.25
No. 168, Finished and Plated all over. Each	4.80	5.70	7.45	10.05	15.65

These Valves are made to order only.

To facilitate ordering: Simply state size and number; the number sufficiently indicates the style and finish.

# GOVERNMENT PATTERN HEAVY RADIATOR VALVES

WITH JENKINS STANDARD DISC

WOOD WHEEL



Nos. 67 G, 68 G AND 69 G  
WITH UNION

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 67 G, Rough Body, Plated all over. Each	3.15	3.90	4.70	6.25	8.15	13.00
No. 68 G, Finished all over..... Each	3.20	4.00	4.80	6.40	8.75	13.85
No. 69 G, Finished and Plated all over. Each	3.60	4.40	5.20	6.80	9.15	14.25

Lock and Shield Valves furnished at same price. Keys Extra.

These Valves are heavier than our Standard Pattern Radiator Valves.

They are especially adapted for use in large buildings, or where a heavier type Valve is necessary or desirable.

They are capable of standing greater strain in connecting up and more severe service in their application, where extreme variations exist in expansion and contraction.

To facilitate ordering: Simply state size and number; the number sufficiently indicates the style and finish.

Finished Valves and Finished and Plated Valves are made to order only.



GOVERNMENT PATTERN  
HEAVY CORNER RADIATOR VALVES  
WITH JENKINS STANDARD DISC  
WOOD WHEEL



LEFT HAND VALVE  
Nos. 145 G, 147 G AND 149 G  
WITH UNION

THESE VALVES ARE MADE RIGHT HAND AND LEFT HAND

Size .....	Inches	1/2	3/4	1	1 1/4	1 1/2	2
No. 145 G, Rough Body, Plated all over.	Each	3.45	4.25	5.15	6.95	8.95	14.25
No. 147 G, Finished all over .....	Each	3.60	4.40	5.30	7.05	9.65	15.25
No. 149 G, Finished and Plated all over.	Each	3.90	4.80	5.70	7.45	10.05	15.65

Lock and Shield Valves furnished at same price. Keys Extra.  
All the above Valves are heavier than our Standard Pattern Radiator Valves.  
They are especially adapted for use in large buildings, or where a heavier type Valve is necessary or desirable.  
They are capable of standing greater strain in connecting up and more severe service in their application, where extreme variations exist in expansion and contraction.  
In ordering, always give Valve number and size, and state whether Right Hand or Left Hand Valves are wanted.  
Finished Valves and Finished and Plated Valves are made to order only.

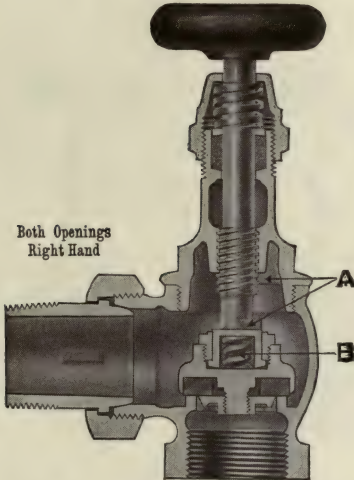
# CRANE STANDARD SELF-ADJUSTED PACKED

## STEAM OR VACUUM SYSTEM RADIATOR VALVES

JENKINS DISC

RISING STEM

(PATENTED)



No. 220 WITH UNION

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 220, Rough Body, Plated all over...Each	3.15	3.90	4.70	6.25	8.15	13.00

The illustration shows at "A" the Crane Patent Stop which is a part of the center piece casting and a lug on the stem of the Valve.

These parts, coming in contact when the Valve is wide open, prevent the jamming of the disc against the center piece.

The auxiliary spring at "B" automatically takes care of any shrinkage in the Jenkins disc, and prevents leaks when the Valve is closed.

These Valves have been thoroughly tested by being connected up under high pressure steam and opened and closed equal to ten years service without showing a leak. As these Valves are generally used on low pressure steam this test is all the more convincing.

Finished Valves and Finished and Plated Valves will be made to order at a special price.

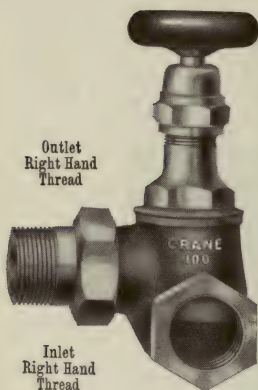
**CRANE STANDARD**  
**SELF-ADJUSTED PACKED**  
**STEAM OR VACUUM SYSTEM RADIATOR VALVES**

JENKINS DISC

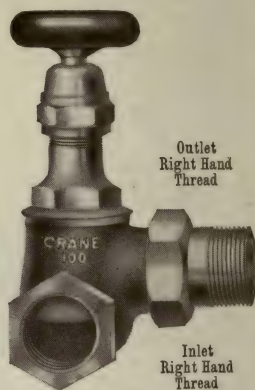
RISING STEM

(PATENTED)

## CORNER VALVES



No. 222  
**LEFT HAND, WITH UNION**



No. 222  
**RIGHT HAND, WITH UNION**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 222, Rough Body, Plated all over. . Each	3.45	4.25	5.15	6.95	8.95	14.25

These Valves have been thoroughly tested by being connected up under high pressure steam and opened and closed equal to ten years service without showing a leak. As these Valves are generally used on low pressure steam this test is all the more convincing.

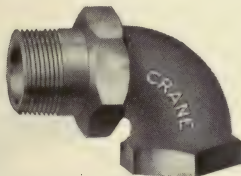
In ordering, state whether Right Hand or Left Hand Corner Valves are wanted. Finished Valves and Finished and Plated Valves will be made to order at a special price.

## HOT WATER RADIATOR VALVES



No. 174  
BOTH OPENINGS R. H.

## BRASS UNION ELBOWS FOR HOT WATER RADIATORS



Nos. 192, 194, 196

### RADIATOR VALVE

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 174, Rough Body, Plated all over	Each	2.40	2.85	3.65	5.05	7.10	10.85

These Valves have a brass plate with an arrow fitted at top of wheel which indicates whether the Valve is open or closed. It is open when the arrow points in the direction of the side opening of Valve; a quarter turn closes it.

The construction of the Valve is such that there is no obstruction, the full area of the pipe being maintained.

A By-pass in the disc insures continuous circulation when the Valve is closed, thereby preventing freezing.

To facilitate ordering: Simply state size and number; the number indicates the style and finish.

### UNION ELBOW

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 192, Rough Body, Plated all over	Each	1.75	2.00	2.50	3.20	4.00	7.00

To facilitate ordering, simply state size and number; the number sufficiently indicates the style and finish.

**LOCK AND SHIELD  
RADIATOR VALVES  
WITH COMPOSITION OR JENKINS DISC**



Any of our Radiator Valves, as shown on pages 58 to 64, can be made with Lock and Shield, when so ordered, at same price.

In describing kind wanted, give Valve numbers, using words "Lock and Shield." Keys extra as per list prices below.

**KEYS FOR LOCK AND SHIELD VALVES**



No. 198  
No. 199



No. 200

			Plated
*No. 198.....	Each		.70
*No. 199.....	Each		1.00
*No. 200.....	Each		.25

\*See table below showing various Lock and Shield Valves these keys will fit.

Size of Valve Inches	No. 48	Nos. 112-113	Nos. 124-144 126-146 128-148	Nos. 67G-145G 68G-147G 69G-149G	Nos. 220-222
3/8	200				
1/2	200	200	198	198	198
3/4	198	198	198	198	198
1	198	198	198	198-199	198
1 1/4	198-199	198	198-199	198-199	198-199
1 1/2	198-199	198-199	198-199	199	198-199
2	199	198-199	199	199	199



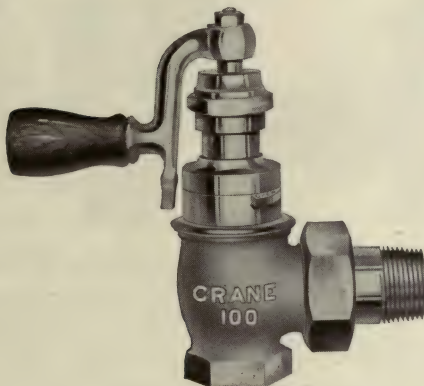
## MODULATING RADIATOR VALVES

BRASS

WITH UNION

SELF-ADJUSTING PACKED STUFFING BOX

(PATENTED)



NO. 231.

Size .....	Inches	½	¾	1	1¼
Price, Rough Body, Plated all over.....	Each	3.15	3.90	4.70	6.25

These Valves allow control of the steam flow to each radiator of a heating plant. These Valves may be adjusted to give the required maximum opening, without dismantling the Valve.

The amount of steam passing through the Valve depends on the area of the opening. By turning the handle the Valve may be opened by degrees according to requirements. An indicator on the top of the Valve shows the exact opening at which the Valve is set at all times. Special shaped guides control the area of the opening, corresponding to the markings on the indicator.

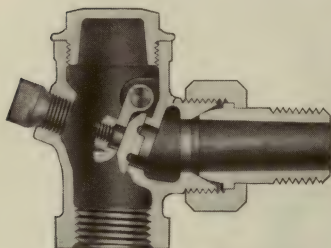
It is a well-known fact that any Valve used to throttle steam will soon leak on account of the cutting action at the seat.

The construction of these Valves is such that the seat is not exposed to the action of the steam, is self-cleaning, insuring a complete shut-off and a longer life to the Valve.

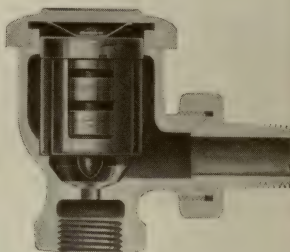
The throttling lip prevents the lodging of foreign matter on the seat. These Valves are placed at the top of the radiator, are of a compact design and have a pleasing appearance.

The Valves are nickel plated, the finished parts polished and are supplied with a polished rosewood handle.

## ACCESSORIES FOR MODULATING HEATING SYSTEMS



**No. 39 ANGLE CHECK VALVE  
WITH UNION**



**No. 8 HOFFMAN  
RETURN LINE VALVE**

Size.....	Inches	$\frac{1}{2}$
No. 39, Rough, not Plated.....	Each	3.55
No. 39, Rough, Plated.....	Each	3.85
No. 8, Hoffman.....	Each	6.00

The No. 39 Angle Check Valve is of the regrinding type, has large areas and no complicated parts.

The No. 8 Hoffman can also be furnished in the corner pattern at an advanced price.



**No. 1165 V  
POP VALVE**

Size.....	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....	Each	6.00	6.75	8.25	11.25	26.00	37.50

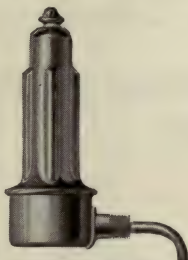
The No. 1165 V Pop Valve is especially ground at the seat so as to be tight under steam pressure or vacuum.

# AUTOMATIC AIR VALVES

## AIR VENT VALVES

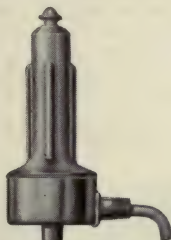


No. 1 A

No. 1 HOFFMAN  
SIPHON AIR VALVENo. 4 HOFFMAN  
JUNIOR  
QUICK VENT AIR VALVE

Size .....	Inches	$\frac{1}{8}$	$\frac{1}{4}$
No. 1 A .....	Each	1.25	
No. 1, Hoffman .....	Each	1.90	
No. 4, Hoffman .....	Each		2.80

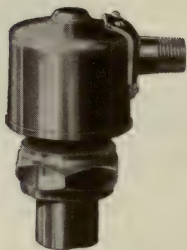
## AIR AND VACUUM VENT VALVES

No. 5 HOFFMAN  
QUICK VENT FLOAT AIR VALVE  
ANDNo. 6 HOFFMAN  
QUICK VENT FLOAT AIR AND  
VACUUM VALVENo. 2 HOFFMAN  
SIPHON AIR AND VACUUM  
VALVE

Size .....	Inches	$\frac{1}{8}$	$\frac{3}{8}$
No. 2, Hoffman .....	Each	4.50	
No. 6, Hoffman .....	Each		12.00
No. 5, Hoffman .....	Each		8.00

**AUTOMATIC AIR VALVES**

**FOR DRIP OR VACUUM AIR LINE SERVICE**



**No. 3 HOFFMAN  
AIR LINE VALVE**

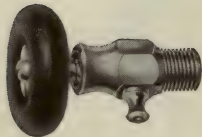


**PAUL VALVE**

No. 3, Hoffman.....	Each	2.50
Paul Valve.....	Each	1.25

These Valves have  $\frac{1}{8}$  inch nipple connection for radiator and  $\frac{1}{4}$  inch union connection.

**COMPRESSION  
RADIATOR AIR VALVES**



**No. 206**



**No. 210**

Size.....	Inches	$\frac{1}{8}$
No. 206, Wood Wheel, Plated.....	Each	.70
No. 210, Lock Shield, Plated.....	Each	.57
Keys for No. 210, Extra.....	Each	.18

# STANDARD HOSE VALVES

BRASS



## NO. 50. IRON HANDLE, LOOSE SWIVEL AND LEATHER DISC

Size.....Inches	1	1¼	1½	2	2½
Price, Rough Body, Plain.....Each	3.15	3.70	4.75	7.00	8.50
Price, Rough Body, Plated all over.... Each	3.65	4.30	5.50	8.00	9.75

## NO. 52. FINISHED BRASS WHEEL, LOOSE SWIVEL AND LEATHER DISC

Size.....Inches	1½	2	2½
Price, Finished all over .....Each	9.00	11.50	14.50
Price, Finished and Plated all over.....Each	10.00	12.75	16.00

These Valves have more clearance than those shown on following page.  
No. 52 Valves are made to order only.

The hose end of these Valves, in sizes from 1 to 2 inch, inclusive, are all fitted with the Chicago Standard hose thread. The 2½ inch is fitted with the Chicago Fire Department hose thread. If a different thread is required, it will be necessary to send us a sample thread, preferably the male end of a hose coupling.

An extra charge will be made for special hose thread, other than those specified.

When so ordered, we will furnish these Valves with iron pipe thread, both ends, at regular prices.



STANDARD  
GARDEN HOSE VALVES

BRASS

WITH LEATHER DISC



Size.....Inches	½	¾	1	1¼	1½	2	2½
Price, No. 56.....Each	1.65	1.65	2.20	3.40	4.75	7.00	15.00
Price, No. 58.....Each	1.65	1.65	2.20	3.40	4.75	7.00	15.00

These Valves will be furnished with Chicago hose thread, California hose thread or iron pipe thread, at regular prices. Any other style thread will be extra. In ordering, always specify the thread required.

## STANDARD HOSE GATE VALVES

These Valves are the No. 440½ Double Gate, Taper Seat Type, as shown on page 47, and the No. 440 Double Gate, Parallel Seat Type, as shown on page 46.

They have standard pipe threads on Female end and hose thread on Male end.

The hose end on sizes from 1 to 2 inch, inclusive, also size 3 inch, is furnished with the Chicago Standard Hose Thread.

The 2½ inch size is furnished with the Chicago Fire Department Hose Thread.

The 2½ and 3 inch sizes can be furnished with National Standard Hose Thread when so ordered.

If any other thread is required, it will be necessary to send us a sample thread, preferably the Male end of a hose coupling.

When so ordered we will supply these Valves with pipe threads on both ends at regular prices.

SEE PAGES 76 AND 77

STANDARD HOSE GATE VALVES

BRASS

DOUBLE GATE

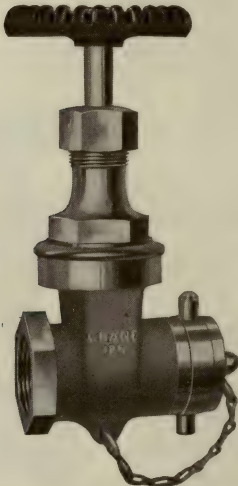
TAPER SEATS

OPEN TO THE LEFT

RIISING STEM

FOR WATER WORKING PRESSURES UP TO 175 POUNDS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



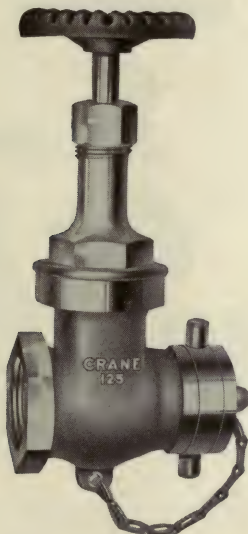
No. 450. IRON WHEEL

Size.....Inches	1	1¼	1½	2	2½	3
Rough Body, Plain, with Brass Cap and Chain. Each	5.10	6.70	8.85	12.60	20.00	29.50
Rough Body, Plain, without Cap and Chain. Each	3.35	4.70	6.25	9.00	15.00	22.00

No. 452. WITH FINISHED BRASS WHEEL

Size.....Inches	1	1¼	1½	2	2½	3
Finished all over, with Brass Cap and Chain. Each	8.65	11.10	14.45	20.90	31.00	45.50
Finished all over, without Cap and Chain. . Each	6.90	9.10	11.85	17.30	26.00	38.00
Fin. and Plated all over, with Brass Cap & Chain. Ea.	9.25	11.80	15.25	21.90	32.25	47.25
Fin. and Plated all over, without Cap & Chain. Each	7.50	9.80	12.65	18.30	27.25	39.75

These Valves are made to order only.

**STANDARD HOSE GATE VALVES****BRASS****DOUBLE GATE****PARALLEL SEATS****OPEN TO THE LEFT****RIISING STEM****FOR WATER WORKING PRESSURES UP TO 175 POUNDS****FOR STEAM WORKING PRESSURES UP TO 125 POUNDS****No. 450½. IRON WHEEL**

Size.....Inches	1	1¼	1½	2	2½
Rough Body, Plain, with Brass Cap and Chain. . . Each	5.10	6.70	8.85	12.60	20.00
Rough Body, Plain, without Cap and Chain. . . . Each	3.35	4.70	6.25	9.00	15.00

**No. 452½. WITH FINISHED BRASS WHEEL**

Size.....Inches	1	1¼	1½	2	2½
Finished all over, with Brass Cap and Chain. . . . Each	8.65	11.10	14.45	20.90	31.00
Finished all over, without Cap and Chain. . . . . Each	6.90	9.10	11.85	17.30	26.00
Fin. and Plated all over, with Brass Cap and Chain..Each	9.25	11.80	15.25	21.90	32.25
Fin. and Plated all over, without Cap and Chain. . Each	7.50	9.80	12.65	18.30	27.25

These Valves are made to order only.

## UNDERWRITER HOSE GATE VALVES

BRASS

DEEP STUFFING BOX

WEDGE GATE

SPECIAL INDICATOR WHEEL

NON-RISING STEM

FOR WATER WORKING PRESSURES UP TO 150 POUNDS



No. 453

Size .....	Inches	1½	2½
Price, Screwed .....	Each	9.00	19.00
Price, with Drain Cock .....	Each	10.00	20.00

These Valves are designed in accordance with the rules and requirements of the National Fire Protection Association.

They are marked "CU" to denote their use for fire protection service.

The 2½ inch size is suitable for use on fire pumps and hydrants.

Both sizes may be used on risers for hose connections.

One end furnished with female pipe threads, the other end with hose threads as specified.

Regularly furnished with Chicago Standard Hose Thread or Chicago Fire Department Hose Thread. The 2½ inch size can be furnished with National Standard Hose Threads in accordance with the Underwriters' rules when so ordered.

If any other hose thread is desired, it will be necessary to send us a sample, preferably the male end of a hose coupling.

These valves will be furnished with a pet cock for draining the outlet side, when so ordered.



# STANDARD COKE OVEN VALVES

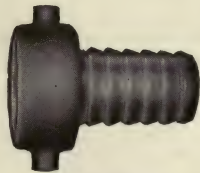
BRASS

WITH LEATHER DISC

FOR WORKING PRESSURES UP TO 125 POUNDS



No. 59

HOSE CONNECTION  
FOR 1 INCH HOSE

Size.....	Inches	1
Price, without Hose Connection.....	Each	1.50
Hose Connection, Extra.....	Each	.40

The hose end of these Valves has an adopted thread. If any special thread is required, it will be necessary to send us a sample thread, preferably the male end of a hose coupling. An extra charge will be made for special threads.

We will make to order  $1\frac{1}{4}$  inch Valves at a special price, according to quantity wanted.

## WHEELS AND HANDLES

FOR BRASS VALVES



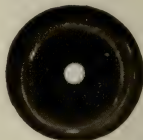
F

NON-HEATING WHEEL  
MALLEABLE IRON



G

FINISHED WHEEL  
BRASS



H

WOOD WHEEL



J

TEE HANDLE  
CAST IRON

The metal wheels shown are interchangeable.

F is our improved non-heating wheel, which is lighter and stronger and has more cooling surface than old style wheels. They do not become heated to such a temperature that they are uncomfortable to hold. The center is dished so that the brass nut on the end of the stem does not come in contact with the hand. With this style rim, the hand does not slip.

J is used on Hose Valves, although it is interchangeable with Valves having metal wheels.

NET PRICE LIST OF WHEELS FOR STANDARD AND MEDIUM VALVES  
EXTRA HEAVY AND HYDRAULIC VALVES TAKE LARGER SIZE WHEELS, AND AT  
A SPECIAL PRICE

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Style F.....Price, Net, Each	.04	.04	.04	.05	.06	.07	.08	.09	.10	.15
Style G.....Price, Net, Each	.25	.25	.30	.35	.50	.60	.70	1.00	1.50	2.00
Style H.....Price, Net, Each	.05	.05	.05	.05	.05	.05	.05	.05		
Top and Bottom Plate and Screw for H...	.05	.05	.05	.05	.05	.05	.05	.05		
Style J.....Price, Net, Each					.08	.10	.12	.15	.15	

Wheel F Japanned or Red Enamel, as ordered.

Order Wheels and Handles by size and number of Valve.

# STANDARD STEAM COCKS BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



No. 250. SQUARE HEAD

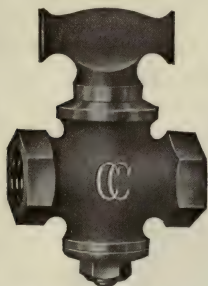


No. 252. FLAT HEAD

Size .....	Inches	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Nos. 250 and 252.....	Each	.85	1.00	1.25	1.70	2.35	3.70
No. 254, Square Head, with Check.....	Each			1.40	1.90	2.55	3.95

Size .....	Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ *	4*
Nos. 250 and 252.....	Each	4.85	7.30	14.50	22.50	38.50	50.00
No. 254, Square Head, with Check.....	Each	5.15	7.65				



No. 256. TEE HANDLE



No. 258. WITH CHECK

Size .....	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 256.....	Each	.85	.85	1.00	1.25	1.70	2.35
No. 258, with Check .....	Each		1.00	1.15	1.40	1.90	2.55

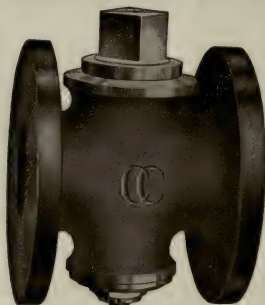
Square Head,  $\frac{1}{2}$  inch to 4 inch, and Tee Handle,  $\frac{1}{2}$  inch to  $\frac{3}{8}$  inch, will always be furnished unless otherwise ordered.

\*NOTE.—The  $3\frac{1}{2}$  and 4 inch Steam Cocks are made only to order at a special discount.

# STANDARD STEAM COCKS

BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



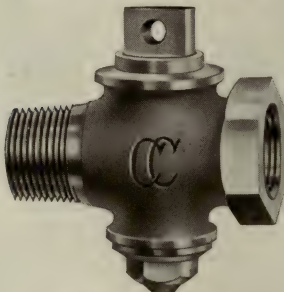
No. 265. FLANGED

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Square or Flat Head.. Each	5.50	7.30	9.70	11.75	18.00	27.50
Diameter of Flanges.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	
Price, Square or Flat Head.. Each	43.00	62.00	84.00	150.00	275.00	
Diameter of Flanges.....Inches	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11	

These Cocks are made to order only.

Templates for drilling, page 649. Price List for drilling, page 141.

## MALE AND FEMALE



No. 266. FLAT HEAD

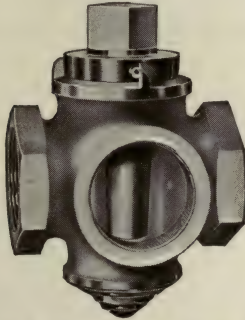
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price..... Each	1.35	1.45	2.00	2.50	3.00	5.35	6.75	9.85

# STANDARD STEAM COCKS

BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS

THREE WAY



WITH  
EXTRA LARGE  
PLUG

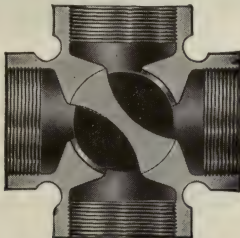
AND  
FULL OPENINGS

No. 268. SQUARE HEAD, WITH CHECK

Size. Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price..Each	1.80	2.10	2.50	3.00	3.75	5.75	7.15	11.00	18.75	26.00

These Cocks can be made to order with plugs having any desired opening, at a special price.

FOUR WAY



No. 269. SQUARE HEAD

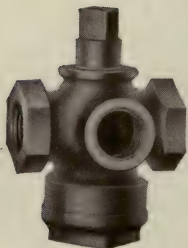
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	6.00	8.50	11.00	14.50	17.50	25.00

These Cocks are made to order only.



**BRASS  
SPRING LOADED COCKS  
FOR COMPRESSED AIR LINES  
TESTED UNDER AIR PRESSURE**

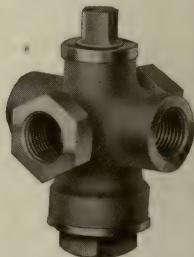
FOR AIR WORKING PRESSURES UP TO 125 POUNDS  
FOR COLD WATER WORKING PRESSURES UP TO 175 POUNDS  
THE SPRING AUTOMATICALLY TAKES UP WEAR



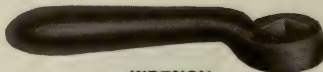
No. 306



No. 305



No. 307



WRENCH

Size.....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 305.....	Each	3.00	3.25	4.50
No. 306, Three Way.....	Each	3.50	4.25	5.25
No. 307, Four Way.....	Each	5.00	5.00	6.75
Wrench, Extra.....	Each	.15	.15	.15

OTHER SIZES MADE TO ORDER. PRICES ON APPLICATION

The spring, which is located between the ground plug and the cap, automatically takes up wear, insuring a tight joint between the plug and body, and at the same time allows a free and easy movement of the plug.

The efficiency and durability of these Cocks, especially under hard and trying service conditions, will be appreciated by all users.

For Iron Body Spring Loaded Cocks, see page 162.

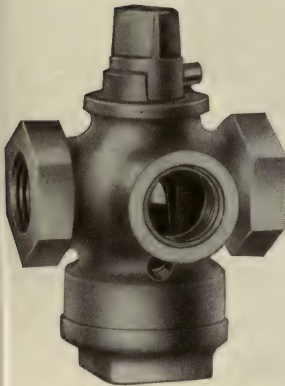
For Four Way Spring Loaded Cocks, see page 166.

# BRASS SPECIAL THREE WAY SPRING LOADED COCK

WITH CHECK

FOR OPERATING AIR HOISTS  
TESTED UNDER AIR PRESSURE

SUITABLE FOR AIR WORKING PRESSURES UP TO 125 POUNDS  
THE SPRING AUTOMATICALLY TAKES UP WEAR



No. 308

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$
Price.....	Each	5.50	7.50
Wrench, Extra.....	Each	.15	.15

OTHER SIZES MADE TO ORDER. PRICES ON APPLICATION

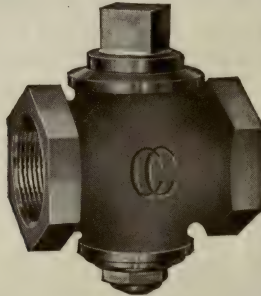
These Cocks are highly recommended for operating Air Hoists.

In raising the load the full pressure enters the bottom of the cylinder and raises the piston, forcing the air in the upper part of the cylinder out through the exhaust port in the Cock.

When the load is lowered, the air in the lower part of the cylinder passes through the Cock into the upper part of the cylinder. In this way the only air used is that required to raise the load.

# HEAVY STANDARD STEAM COCKS BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 260. SQUARE HEAD

No. 262. FLAT HEAD

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Price.....Each	1.25	1.70	2.35	3.70	4.85	7.30	14.50	22.50

These Cocks are made to supply a demand for a heavier Cock than the Standard.

## WRENCHES FOR BRASS STEAM AND GAS COCKS

SQUARE HEAD

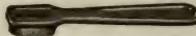


MALLEABLE IRON

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½ & 3	3½ & 4
Number .....	1	2	3	4	5	6	7	8	9	10
Square Head .....	.05	.06	.07	.09	.14	.19	.25	.44	.56	1.00

## WRENCHES FOR BRASS STEAM AND GAS COCKS

FLAT HEAD



MALLEABLE IRON

Size.....Inches	½	¾	1	1¼	1½	2	
Number.....	1	2	3	5	6	7	8
Flat Head.....Each	.07	.09	.14	.25	.44	.56	1.00

Above Wrenches suitable for all Flat Head, Brass, Steam and Gas Cocks except Nos. 262 and 266, Wrenches for which should be ordered from following table.

Size.....Inches	½	¾	1	1¼	1½	2
Number.....	2	3	5	6	7	8

The above Wrenches do not fit Iron Cocks. Wrenches for Iron Cocks, see Price List, page 164.

## EXTRA HEAVY HARD METAL STEAM COCKS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**No. 80 E SQUARE HEAD**

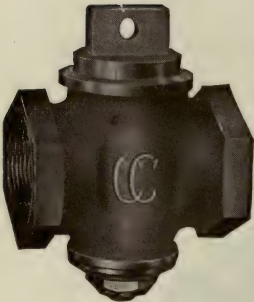
Size...Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.. Each	1.40	1.75	1.75	2.40	3.60	6.00	7.75	11.50	23.00	35.00

These Cocks are made of hard metal which is almost as hard as steel, are extra heavy, with liberal bearings, and are finished with great care.

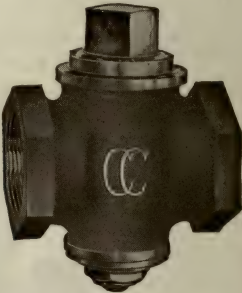
These important features insure a tight cock which will give good service.

STANDARD  
GAS SERVICE COCKS

BRASS



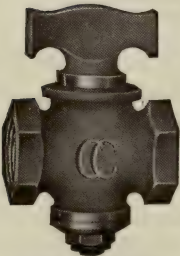
No. 270. FLAT HEAD



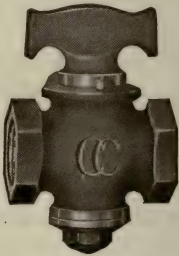
No. 272. SQUARE HEAD

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 270, Flat Head, Female....Each	.75	.85	.95	1.15	1.50	2.25	3.10	5.00
No. 272, Square Head, Female..Each	.75	.85	.95	1.15	1.50	2.25	3.10	5.00

Unless otherwise ordered, Flat Head Cocks will always be furnished.



No. 276. TEE HANDLE



No. 278. WITH CHECK

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 276.....Each	.75	.85	.95	1.15
No. 278, with Check.....Each	.90	1.00	1.10	1.35



**STANDARD**  
**GAS METER COCKS**

**BRASS**

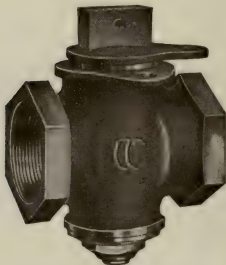


**No. 280. FLAT HEAD**

Size.....	Inches	$\frac{3}{4}$
Price.....	Each	1.40

## STANDARD LOCK GAS SERVICE COCKS

BRASS



No. 284. FLAT HEAD

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price .....	Each	1.30	1.60	2.10	3.50	5.00	7.00

## ROUND-WAY LOCK GAS SERVICE COCKS

BRASS



No. 285. FLAT HEAD

Size .....	Inches	$\frac{3}{4}$
Price .....	Each	2.00

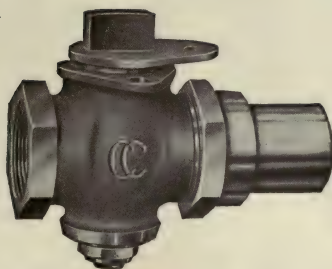
The Round-Way Opening Lock Cocks have more area than the Flatway Cocks, and are made of Red Brass.

PRICES DO NOT INCLUDE LOCK

**STANDARD LOCK**

**UNION METER COCKS**

**BRASS**



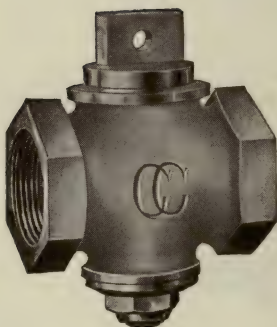
**No. 288. FLAT HEAD**

Size .....	Inches	$\frac{3}{4}$
Price .....	Each	1.80

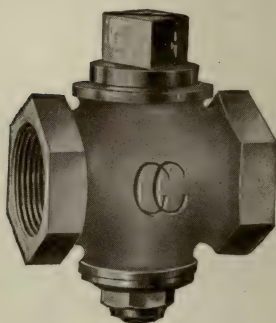
**PRICES DO NOT INCLUDE LOCK**

# **SPECIAL HEAVY GAS SERVICE COCKS**

**BRASS**



**No. 292. FLAT HEAD**



**No. 294. SQUARE HEAD**

Size. Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price .Each	.85	.95	1.05	1.30	1.70	2.60	3.60	6.50	12.00	18.00

Flat Head Gas Cocks are always furnished, unless otherwise ordered.

These goods are made to supply a demand by certain gas companies for a superior article.

They are especially well ground and strong enough to stand any abuse of the fitter.

**ALL COCKS ARE THOROUGHLY TESTED BEFORE LEAVING THE FACTORY**





## ROUGH STOPS

### SCREWED FOR IRON PIPE

TEE OR LEVER HANDLE

NUT AND WASHER



No. 804

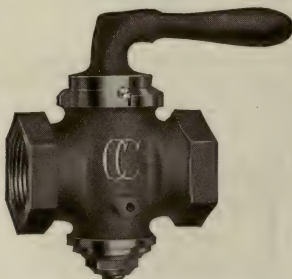
Size . . . . . Inches	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Price, Tee Handle, Per dozen	21.00	29.40	36.00	52.80	89.40	149.40	258.00
Price, Lever Handle, Per dozen	21.00	29.40	36.00	52.80	89.40	149.40	258.00

## CHECK AND WASTE

### SCREWED FOR IRON PIPE

TEE OR LEVER HANDLE

NUT AND WASHER



No. 806

Size . . . . . Inches	1/2	5/8	3/4	1	1 1/4	1 1/2	2
Price, Tee Handle with C. & W. Per dozen	21.60	30.00	36.60	54.00	91.20	152.40	264.00
Price, Lever Handle with C. & W. Per dozen	21.60	30.00	36.60	54.00	91.20	152.40	264.00

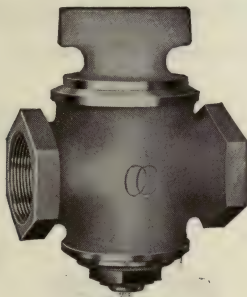
WASTE TUBES EXTRA

## ROUND-WAY ROUGH STOPS

### SCREWED FOR IRON PIPE

TEE OR LEVER HANDLE

NUT AND WASHER



No. 812

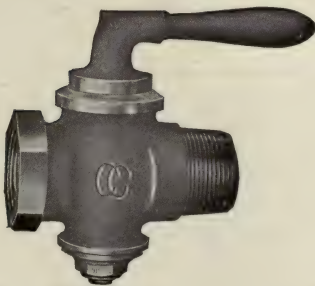
Size .....	Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Tee Handle . Per dozen		26.40	36.00	46.20	73.80	120.60	197.40	342.00
Price, Lever Handle. Per dozen		26.40	36.00	46.20	73.80	120.60	197.40	342.00
Price, Tee Handle with C. & W. . Per dozen		27.00	36.60	46.80	75.00	122.40	200.40	348.00
Price, Lever Handle with C. & W. Per dozen		27.00	36.60	46.80	75.00	122.40	200.40	348.00

## BRINE COCKS

BRASS

MALE AND FEMALE

LEVER HANDLE



No. 814

Size .....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price .....	Each	1.25	1.35	2.00	3.00	4.50

# REVERSIBLE STOP AND WASTE COCKS

TESTED TO 200 POUNDS HYDRAULIC PRESSURE

SCREWED FOR IRON PIPE

INTERCHANGEABLE FROM RIGHT TO LEFT



**No. 820, FLAT WAY, OR No. 822, ROUND WAY  
TEE OR LEVER HANDLE**

Size.... Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
No. 820, Flat Way.....Per dozen	21.00	29.40	36.00	52.80
No. 820, with Check and Waste.....Per dozen	21.60	30.00	36.60	54.00
No. 822, Round Way.....Per dozen	26.40	36.00	46.20	73.80
No. 822, with Check and Waste.....Per dozen	27.00	36.60	46.80	75.00

These Reversible Stop Cocks are fully guaranteed as to workmanship and material. They embody the best points of other makes of Cocks, and also important features of our own design.

When ordering, always give style number, and state if they are wanted with or without waste, and whether with Tee or Lever Handle. Unless otherwise specified, we will furnish Lever Handle Cocks.

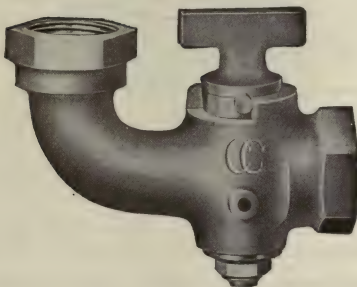
WASTE TUBES EXTRA

## HYDRANT COCKS

NUT AND WASHER

CHECK AND WASTE.

## SCREWED FOR IRON PIPE



No. 816

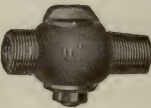
Size.....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....	Per dozen	25.80	45.00	64.80	103.80

WASTE TUBES EXTRA

CORPORATION STOP COCKS



No. 830



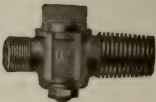
No. 833



No. 834



No. 835



No. 836

Nos. 830 and 833. Have inside thread to fit Mueller, Payne's and Lennox Tapping Machine Screw Plugs, and long male thread for Mueller, Payne's and Lennox Taps.

No. 833. Has Iron Pipe Thread on outlet one size larger.

No. 834. Has Iron Pipe Threads both ends.

Nos. 835 and 836. Have coarse thread for Wood Pipe Mains.

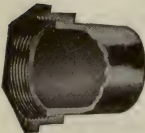
No. 836. Has Iron Pipe Thread on outlet.

Nos. 830 and 835. Furnished with straight Tail Piece when so specified.

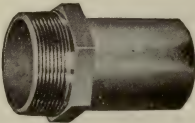
Nos. 833, 834 and 836. In 5/8 inch size, have 3/4 inch Iron Pipe Thread on outlet.

Size of opening .....	Inches	1/2	5/8	3/4	1
No. 830 .....	Per dozen	19.20	27.00	34.20	54.00
No. 833 .....	Per dozen	17.40	23.40	30.00	48.00
No. 834 .....	Per dozen	17.40	23.40	30.00	48.00
No. 835 .....	Per dozen	24.00	32.40	40.80	64.80
No. 836 .....	Per dozen	22.20	28.80	36.60	58.80

SOLDERING UNIONS AND NIPPLES



No. 842



No. 844



No. 846

Size .....	Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 842, Union.....	Per dozen	4.80	6.00	7.80	10.20	13.20	15.00	21.00
No. 844, Male Nipple.....	Per dozen	3.60	4.20	6.00	8.40	10.80	15.00	21.00
No. 846, Female Nipple....	Per dozen	3.60	4.20	6.00	8.40	10.80	15.00	21.00

Soldering Nipples larger than 2 inch, made to order at a special price.  
Drainage Soldering Nipples, page 313.



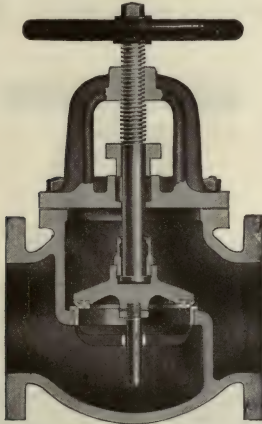
# STANDARD GLOBE, ANGLE AND CROSS VALVES

IRON BODY

WITH YOKE

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 351. GLOBE VALVE

## MERITS OF STANDARD VALVES

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE; TO DO SO OPEN THE VALVE WIDE UNTIL THE DISC NUT FORMS A JOINT BY CONTACT WITH THE LOWER FACE OF BONNET FLANGE.

Our Standard Valves are well proportioned, of good weight, and suitable to stand steam working pressures up to 125 pounds.

They are tested to 150 pounds hydraulic pressure with the Valve closed, and we have at various times subjected them to a hydraulic pressure, without leaking, as follows:

Size.....	2 to 5 in.	6 to 8 in.	10 to 12 in.
Tight when closed.....	500 lbs.	250 lbs.	200 lbs.
Tight when open.....	1000 lbs.	500 lbs.	475 lbs.

but, as stated above, we do not recommend them for more than 125 pounds working steam pressure.

It is not only a question of the Valves standing a higher pressure, but also standing the strain of expansion, contraction, weight of piping and settling, also the cutting effect of the steam on the disc and seat.

Standard Valves are made with brass stem in sizes 6 inch and smaller and with steel stem, nickel-plated, in larger sizes. In the latter Valves the stuffing box flange is made of Malleable Iron, with a brass follower, which gives additional strength and durability at this point.

The Globe and Angle Valves 2½ inch and larger have guide on swivel disc and bridge on seat, which insures the square seating of the disc and also prevents the rattling of the disc caused by the pulsation of the steam passing through a partly open Valve.

Flanged Valves will always be furnished smooth faced and not drilled, unless otherwise ordered.

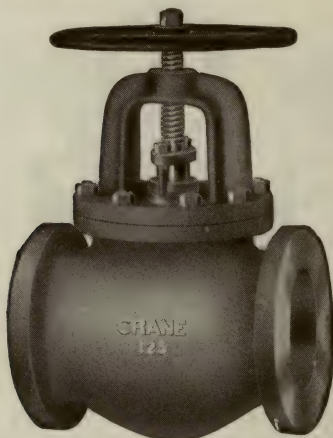
# STANDARD GLOBE VALVES

IRON BODY

WITH YOKE

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 350, Screwed ..... Each	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
No. 351, Flanged ..... Each	8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00
Face to Face, Flanged.....Inches	8	8½	9½	10½	11½	12	13	14
Diam. Flanges.....Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	10	12	14	15	16	
No. 350, Screwed ..... Each	63.00	72.00	114.00	170.00				
No. 351, Flanged ..... Each	68.00	77.00	123.00	187.00	350.00		475.00	
Face to Face, Flanged ..... Inches	16	17	20	24	28	30	32	
Diam. Flanges.....Inches	12½	13½	16	19	21	22¼	23½	

**ALL IRON** Valves made to order at a special price.

For general dimensions, see page 657.

Templates for drilling, page 650. Price List for drilling, page 141.

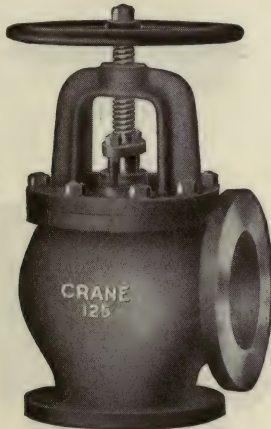
## STANDARD ANGLE VALVES

IRON BODY

WITH YOKE

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 352, Screwed.....Each	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
No. 353, Flanged.....Each	8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00
Cent. to Face, Flgd...Ins.	4	4¼	4¾	5¼	5¾	6	6½	7
Diam. Flanges.....Inches	6	7	7½	8½	9	9¾	10	11
Size.....Inches	7	8	10	12	14	15	16	
No. 352, Screwed.....Each	63.00	72.00	114.00	170.00				
No. 353, Flanged.....Each	68.00	77.00	123.00	187.00	350.00		475.00	
Cent. to Face, Flgd...Ins.	8	8½	10	12	14	15	16	
Diam. Flanges.....Inches	12½	13½	16	19	21	22¼	23½	

**ALL IRON** Valves made to order at a special price.

Center to face dimensions mean to Inlet or Outlet.

For general dimensions, see page 657.

Templates for drilling, page 650. Price List for drilling, page 141.

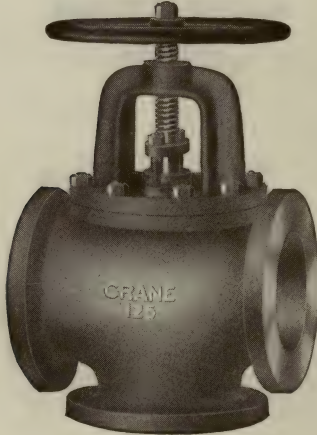
STANDARD  
CROSS VALVES

IRON BODY

WITH YOKE

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 362. SCREWED

Size.....Inches	3	3½	4	4½	5	6	7	8	10	12
Price..... Each	16.25	20.00	23.50	30.65	35.25	47.25	78.00	92.00	162.00	240.00

No. 363. FLANGED

Size..... Inches	3	3½	4	4½	5	6	7	8	10	12
Price..... Each	20.00	25.00	28.50	36.00	41.00	54.00	85.00	100.00	175.00	265.00
Diameter of Flanges..Inches.	7½	8½	9	9¾	10	11	12½	13½	16	19
Face to Face, Flanges..Inches	9½	10½	11½	12	13	14	16	17	20	24

For general dimensions, see page 657.

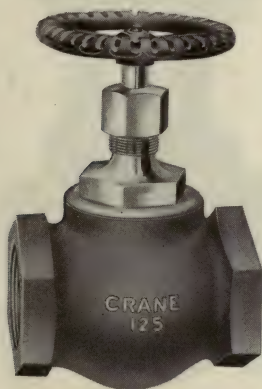
Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD GLOBE, ANGLE AND CROSS VALVES

IRON BODY

BRASS MOUNTED

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size.....Inches	2	2½	3
No. 354, Globe, Screwed.....Each	5.40	7.35	9.80
No. 355, Globe, Flanged.....Each	7.00	9.00	12.50
No. 356, Angle, Screwed.....Each	5.40	7.35	9.80
No. 357, Angle, Flanged.....Each	7.00	9.00	12.50
No. 364, Cross, Screwed.....Each	6.50	9.00	12.50
No. 365, Cross, Flanged.....Each	9.00	11.75	16.50
Face to Face, Flanged, Globe and Cross.....Inches	8	8½	9½
Center to Face, Flanged, Angle and Cross.....Inches	4	4¼	4¾
Diameter of Flanges.....Inches	6	7	7½

## ALL IRON Nos. 348 GLOBE AND 349 ANGLE

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Price, Screwed....Each	3.60	3.85	5.70	6.00	6.60	7.50	9.40	12.50

Specify clearly, when **ALL IRON** Valves are wanted. Otherwise, Brass Mounted Valves will always be furnished.

For general dimensions, see page 657.

Templates for drilling, page 650. Price List for drilling, page 141.



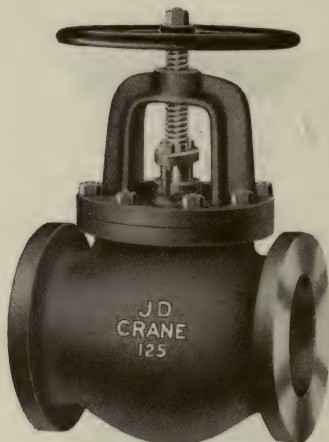
# JENKINS DISC GLOBE AND ANGLE VALVES

IRON BODY

WITH YOKE

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Renewable  
Jenkins DiscEasily Taken Out  
and Replaced

No. 359

Size . . . . . Inches	2½	3	3½	4	4½	5
No. 358, Globe or Angle, Screwed. Each	12.00	16.75	19.50	24.00	32.00	40.00
No. 359, Globe or Angle, Flanged. Each	14.00	18.50	21.50	26.00	34.00	42.00
Size . . . . . Inches	6	7	8	10	12	
No. 358, Globe or Angle, Screwed. Each	48.00	80.00	90.00	130.00	185.00	
No. 359, Globe or Angle, Flanged. Each	50.00	80.00	90.00	130.00	185.00	

Valves 7 inch and larger have steel stem, plated; smaller sizes, brass stem.

In ordering, specify whether Globe or Angle Valves are wanted, otherwise Globe Valves will be furnished.

When Valves are wanted for cold water, they will be furnished with Jenkins Soft Disc, at same price.

Valves for air will be made to order with Jenkins Soft Disc at a special price.

For general dimensions, see page 659.

Templates for drilling, page 650. Price List for drilling, page 141.

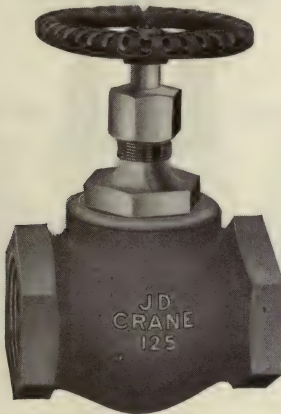
For extra Jenkins Soft Discs, see page 105.

# JENKINS DISC GLOBE AND ANGLE VALVES

IRON BODY

BRASS MOUNTED

FOR STEAM WORKING PRESSURE UP TO 125 POUNDS



Renewable  
Jenkins Disc

Easily Taken Out  
and Replaced

No. 360

Size.....	Inches	2	2½	3
No. 360, Globe or Angle, Screwed.....	Each	7.25	11.00	16.00

In ordering, specify whether Globe or Angle Valves are wanted, otherwise Globe Valves will be furnished.

When Valves are wanted for cold water, they will be furnished with Jenkins Soft Disc, at same price.

Valves for air will be furnished with Jenkins Soft Disc at a special price.

These Valves are made with screwed ends only.

For general dimensions, see page 659.

## EXTRA JENKINS DISCS

Size.....	Inches	2	2½	3	3½	4	4½
Price.....	Each	.36	.48	.80	1.00	1.20	1.40
Size.....	Inches	5	6	7	8	10	12
Price.....	Each	1.60	2.00	2.40	2.80	4.50	5.00

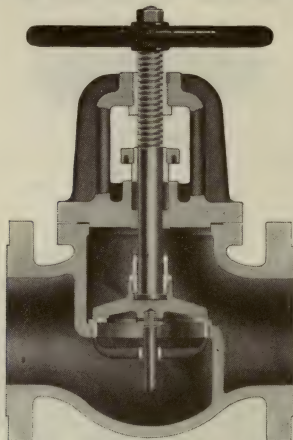
## MEDIUM GLOBE, ANGLE AND CROSS VALVES

FERROSTEEL BODY

WITH YOKE

CRANE SPECIAL BRASS SEATS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 341. GLOBE VALVE

The demand for Medium Valves suitable for steam working pressures between our Standard and Extra Heavy, is so frequent that we have been induced to make a complete line of patterns to meet the requirements of this trade.

The Body of these Valves, all sizes, is made of Ferrosteel. The Yoke is made of Ferrosteel in sizes 8 inch and larger. In Medium Valves the Stem in sizes 2 to 5 inch is made of brass and larger sizes of steel, plated.

The stuffing box flange on all Valves having a steel stem is made of Malleable Iron with a brass follower, which gives additional strength and durability to these parts.

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE; TO DO SO, OPEN THE VALVE WIDE UNTIL THE DISC NUT FORMS A JOINT BY CONTACT WITH THE LOWER FACE OF BONNET FLANGE.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with  $\frac{1}{16}$  inch raised face, for which we make no extra charge.

This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used, as this gasket draws down to  $\frac{1}{32}$  inch or less and the heavy bolting would (without the raised face) spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

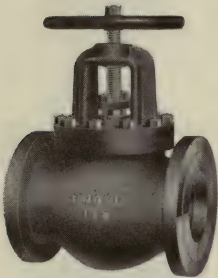
## MEDIUM GLOBE VALVES

FERROSTEEL BODY

WITH YOKE

CRANE SPECIAL BRASS SEATS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 341



No. 341 BP

Size . . . . . Inches	2	2½	3	3½	4	4½
No. 340, Screwed . . . . . Each	13.00	16.00	20.00	24.00	28.00	35.00
No. 341, Flanged . . . . . Each	15.00	18.00	23.00	28.00	33.00	40.00
Size . . . . . Inches	5	6	7	8	10	12
No. 340, Screwed . . . . . Each	42.00	50.00	80.00	90.00	135.00	190.00
No. 341, Flanged . . . . . Each	47.00	55.00	85.00	95.00	145.00	200.00
No. 341 BP, Flanged, with By-Pass.. Each		85.00	115.00	125.00	195.00	250.00

We do not recommend the use of Screwed Valves larger than 6 inch.

The By-Pass on Globe Valves is located on the right hand side looking at the inlet end, that is, the end with the passage under the disc. It is desirable that all Valves 6 inch and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

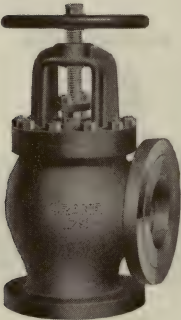
For general dimensions, see page 661.

Templates for drilling, page 652. Price List for drilling, page 152.

MEDIUM  
ANGLE VALVES

FERROSTEEL BODY                      WITH YOKE                      CRANE SPECIAL BRASS SEATS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 343



No. 343 BP

Size.....Inches	2	2½	3	3½	4	4½
No. 342, Screwed.....Each	13.00	16.00	20.00	24.00	28.00	35.00
No. 343, Flanged.....Each	15.00	18.00	23.00	28.00	33.00	40.00
Size.....Inches	5	6	7	8	10	12
No. 342, Screwed.....Each	42.00	50.00	80.00	90.00	135.00	190.00
No. 343, Flanged.....Each	47.00	55.00	85.00	95.00	145.00	200.00
No. 343 BP, Flanged, with By-Pass..Each		85.00	115.00	125.00	195.00	250.00

We do not recommend the use of Screwed Valves larger than 6 inch.

The By-Pass on Angle Valves is located on the back, that is, opposite the outlet. It is desirable that all Valves 6 inch and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 661.

Templates for drilling, page 652.    Price List for drilling, page 152.



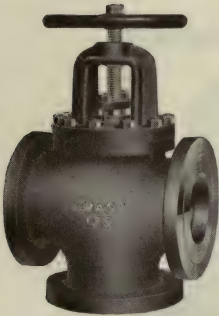
## MEDIUM CROSS VALVES

FERROSTEEL BODY

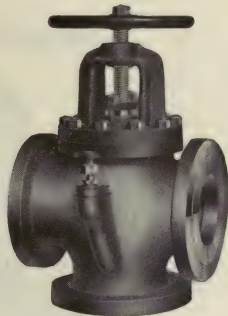
WITH YOKE

CRANE SPECIAL BRASS SEATS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 345



No. 345 BP

Size.....Inches	2½	3	3½	4	4½	5
No. 344, Screwed.....Each	22.00	27.00	32.00	37.00	45.00	54.00
No. 345, Flanged.....Each	25.00	31.00	37.00	43.00	52.00	60.00
Size.....Inches	6	7	8	10	12	
No. 344, Screwed.....Each	65.00	100.00	115.00	185.00	260.00	
No. 345, Flanged.....Each	72.00	107.00	122.00	195.00	275.00	
No. 345 BP, Flanged, with By-Pass..Each	102.00	137.00	152.00	245.00	325.00	

We do not recommend the use of Screwed Valves larger than 6 inch. It is desirable that all Valves 6 inch and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 661.

Templates for drilling, page 652. Price List for drilling, page 152.

## EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

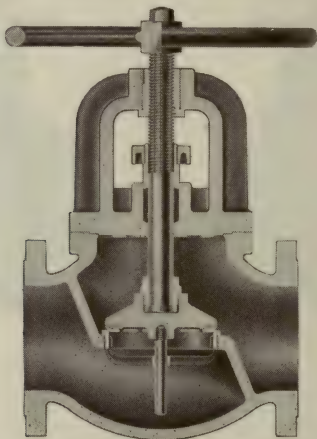
FERROSTEEL

WITH YOKE

HARD METAL SEATS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 21 E GLOBE VALVE

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE; TO DO SO, OPEN THE VALVE WIDE UNTIL THE DISC NUT FORMS A JOINT BY CONTACT WITH THE LOWER FACE OF BONNET FLANGE.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with  $\frac{1}{16}$  inch raised face, for which we make no extra charge. This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used. This gasket draws down to  $\frac{1}{32}$  inch or less and the heavy bolting would otherwise spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

## EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

FERROSTEEL

WITH YOKE

HARD METAL SEATS

**FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

These Valves are tested to 800 pounds hydraulic pressure per square inch with Valve open, and are also tested with the Valve closed and the pressure under the disc to 300 pounds hydraulic pressure. We have at various times subjected them to a hydraulic pressure with the Valve closed and the pressure under the disc as follows:

Size:           2½ to 3 inch.   4 to 5 inch.   6 inch.   8 to 10 inch.   12 inch.  
Tight at:   1500 pounds   1200 pounds   800 pounds   500 pounds   300 pounds

It will be seen that some sizes of these Valves will not stand the full pressure of 800 pounds under the discs. This we consider unnecessary, as there are never any unusual strains affecting this part of the Valve.

Actual Bursting Pressures of Extra Heavy  
Cast Iron Globe, Angle and  
Cross Valves

Sizes	Pounds
4 to 6 inch	2400 to 3000
10 and 12 inch	1200 to 1450
14 inch	1400

Actual Bursting Pressures of Ferrosteel  
Extra Heavy Globe, Angle and  
Cross Valves

Sizes	Pounds
4 to 6 inch	3200 to 4000
10 and 12 inch	1550 to 1800
14 inch	O. K. at 1500

**THE BODY AND YOKE OF EXTRA HEAVY VALVES ARE MADE OF FERROSTEEL**

The above table of comparative destructive Hydraulic tests will be useful as a guidance to engineers in adopting a factor of safety applicable to varying conditions.

The factor of safety used by us is conservatively high, but it is not only a question of the goods standing the pressure, but also standing the strains of expansion, contraction, settling, weight of piping and water hammer; also the cutting effect of the steam, as the destruction of the seat of a Valve which renders it necessary to renew a Valve in a large plant is a very serious matter. Hence it follows that the brass used in all these Valves should be and is, of a superior quality. A really good article is now furnished so cheap that there is no economy in using an inferior quality.

### CONSTRUCTION

The body of this Valve is very heavy, and has large and free openings.

The seat in the body is made extra heavy of hard metal, and has our Improved Bridge to guide the swivel disc.

The swivel disc is made with a guide. Sizes up to 3½ inch are made extra heavy of solid hard metal. The larger sizes, 4 inch and upward, are made very heavy of Cast Iron, with hard metal facing, thereby making the disc very rigid.

The combination of the guide on the disc and the bridge on the seat ensures the square seating of the disc, and also prevents the rattling of the disc caused by the pulsation of the steam passing through a partly open Valve.

The liability of the seat and disc in a Valve subjected to extreme steam pressure being cut or wire-drawn, makes it necessary to use the very best metal that can be made for these parts.

Hard Metal is the very best material that can be made to stand the wear which the seats of these valves are subjected to.

If desired we can furnish these Valves with the Crane Removable Copper Disc at a special price.

THESE VALVES ARE FITTED WITH OUR IMPROVED DISC NUT, WHICH EN-  
ABLES THE VALVES TO BE PACKED WHEN OPEN WITHOUT STEAM ESCAPING.

The stem in all sizes is made of Steel, and plated, and the stuffing box flange is made of Malleable Iron, with a brass follower, which gives additional strength and durability to these parts.

The wheel is very large in order to enable the operator to get a good leverage in thoroughly closing the Valve.

## EXTRA HEAVY GLOBE VALVES

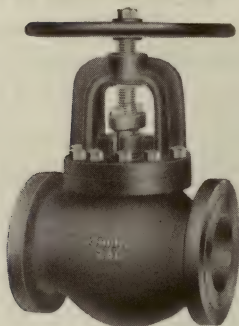
FERROSTEEL

WITH YOKE

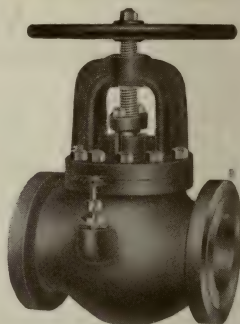
HARD METAL SEATS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 21 E



No. 27 E

Size.....Inches	2	2½	3	3½	4	4½	5
No. 20 E, Screwed.....Each	26.00	33.00	37.00	42.00	46.00	56.00	61.00
No. 21 E, Flanged.....Each	27.50	35.00	40.00	45.00	50.00	60.00	65.00
Size.....Inches	6	7	8	10	12	14	15
No. 20 E, Screwed.....Each	75.00	95.00	114.00	190.00			
No. 21 E, Flanged.....Each	80.00	100.00	120.00	200.00			
No. 27 E, Flanged, with By-Pass. Each	110.00	130.00	150.00	250.00	350.00	450.00	450.00

We do not recommend the use of Screwed Valves larger than 6 inch.

The By-Pass on Globe Valves is located on the right hand side looking at the inlet end, that is, the end with the passage under the disc. It is desirable that all Valves 6 inch and larger have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 663.

Templates for drilling, page 652. Price List for drilling, page 152.

# EXTRA HEAVY ANGLE VALVES

FERROSTEEL

WITH YOKE

HARD METAL SEATS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 23 E



No. 29 E

Size.....Inches	2	2½	3	3½	4	4½	5
No. 22 E, Screwed.....Each	26.00	33.00	37.00	42.00	46.00	56.00	61.00
No. 23 E, Flanged.....Each	27.50	35.00	40.00	45.00	50.00	60.00	65.00
Size.....Inches	6	7	8	10	12	14	15
No. 22 E, Screwed.....Each	75.00	95.00	114.00	190.00			
No. 23 E, Flanged.....Each	80.00	100.00	120.00	200.00			
No. 29 E, Flanged, with By-Pass. Each	110.00	130.00	150.00	250.00	350.00	450.00	450.00

We do not recommend the use of Screwed Valves larger than 6 inch.

The By-Pass on Angle Valves is located on the back, that is, opposite the outlet. It is desirable that all Valves, 6 inch and larger, have a By-Pass.

In ordering, always specify the style number of Valve wanted.

For general dimensions, see page 663.

Templates for drilling, page 652. Price List for drilling, page 152.



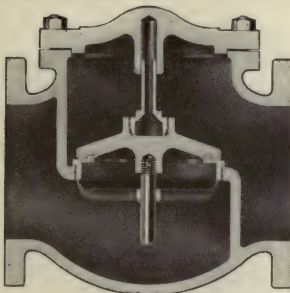


## STANDARD HORIZONTAL CHECK VALVES

IRON BODY

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 367

No. 366 SCREWED

Size.....Inches	2	2½	3	3½	4	4½	5	6
Price.....Each	3.60	6.50	8.90	12.25	14.25	19.00	22.00	30.00

No. 367 FLANGED

Size.....Inches	3	4	5	6	7
Price.....Each	11.50	18.00	26.00	35.00	50.00
Face to Face.....Inches	9½	11½	13	14	16
Diam. Flanges.....Inches	7½	9	10	11	12½
Size.....Inches	8	10	12	14	15
Price.....Each	62.00	115.00	175.00	300.00	
Face to Face.....Inches	17	20	24	28	30
Diam. Flanges.....Inches	13½	16	19	21	22½

Sizes 3 inch and smaller are furnished with a brass cap, which is screwed into the body. Sizes 3½ inch and larger are furnished with an iron cap bolted to the body.

Larger sizes made to order at a special price.

For general dimensions, see page 664.

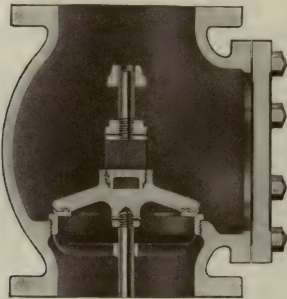
Templates for drilling, page 650. Price List for drilling, page 141.

STANDARD  
VERTICAL CHECK VALVES

IRON BODY

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 369

No. 368. SCREWED

Size.....	Inches	2½	3	3½	4
Price.....	Each	9.50	12.50	17.00	21.00
Size.....	Inches	4½	5	6	
Price.....	Each	30.00	33.00	40.00	

No. 369. FLANGED

Size.....	Inches	6	7	8	10
Price .....	Each	45.00	67.00	78.00	135.00
Face to Face.....	Inches	14	16	17	20
Diameter of Flanges.....	Inches	11	12½	13½	16

Vertical Check Valves are furnished in all sizes with bolted cap.  
For general dimensions, see page 664.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD SWING CHECK VALVES

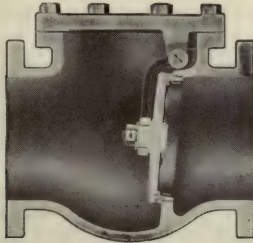
## WITH BRASS OR LEATHER DISC

IRON BODY

BRASS SEAT

FOR STEAM WORKING PRESSURES SIZES 16 INCH AND SMALLER,  
UP TO 125 POUNDS. ABOVE 16 INCH UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	2	2½	3	3½	4	4½	5
No. 372, Screwed, with Brass Disc... Each	11.00	12.00	13.50	17.50	20.00	26.00	30.00
No. 373, Flanged, with Brass Disc... Each	13.00	14.50	17.00	21.00	24.00	30.00	34.00
Add for Leather Disc..... Each	1.00	1.50	2.00	2.50	3.00	3.50	4.00
No. 374, Hub, with Leather Disc... Each			19.00		27.00		38.00
Diameter of Flanges.....Inches	6	7	7½	8½	9	9¼	10
Size.....Inches	6	7	8	10	12	14	
No. 372, Screwed, with Brass Disc... Each	36.00	55.00	70.00	110.00	160.00		
No. 373, Flanged, with Brass Disc... Each	41.00	60.00	75.00	115.00	168.00	340.00	
Add for Leather Disc..... Each	4.00	6.00	7.50	10.00	12.00		
No. 374, Hub, with Leather Disc... Each	45.00		82.50	125.00	185.00	340.00	
Diameter of Flanges.....Inches	11	12½	13½	16	19	21	
Size.....Inches	15	16	18	20	24	30	
No. 373, Flanged, with Brass Disc... Each	400.00	450.00	600.00	700.00	1000.00	1650.00	
No. 374, Hub, with Leather Disc... Each		450.00	600.00	700.00	1000.00	1650.00	
Diameter of Flanges.....Inches	22¼	23½	25	27½	32	38¾	

Swing Check Valves, Screwed and Flanged, for COLD Water, preferably should have LEATHER discs. For hot water or steam, brass discs should be used. Unless otherwise specified on order, Screwed and Flanged Swing Check Valves will be furnished with brass discs, and Hub End Swing Check Valves with leather discs.

Valves made to order with By-Pass. Prices on application.

Hub End Check Valves may be used for the same water working pressures as recommended for Hub End Gate Valves, page 132.

For general dimensions, see page 664.

Templates for drilling, page 650. Price List for drilling, page 141.

STANDARD  
CLEARWAY SWING CHECK VALVES

IRON BODY

BRASS TRIMMINGS

FOR FIRE PROTECTION SERVICE, UNDERWRITERS' PATTERN

FOR WATER WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 375

Size.....Inches	2½	3	4	5	6	8	10	12
No. 375, Flanged... Each	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
No. 374½, Screwed .Each	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
No. 375½, Hub End.Each	14.50	17.00	24.00	34.00	41.00	75.00	115.00	168.00
Add for Leather Disc . . . Each	1.50	2.00	3.00	4.00	4.00	7.50	10.00	12.00

These Valves are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

Valves are marked "CU" to denote their use for fire protection service.

Furnished in Flanged, Screwed and Hub End Patterns as required, and with BRASS FACED or LEATHER FACED discs as specified. Unless otherwise specified, BRASS FACED DISCS will be furnished.

These Valves are provided with bosses that may be tapped for by-pass when desired.



# STANDARD FOOT VALVES

IRON BODY

WITH STRAINER

BRASS SEAT RING

BRASS CLAPPER



STYLE, SIZES 2 INCH  
TO 6 INCH



STYLE, SIZES 7 AND  
8 INCH

No. 394 1/2

Size	Price No. 394 1/2 Screwed	Price No. 395 1/2 Flanged	Largest O. D. No. 394 1/2	Total Height No. 394 1/2	Largest O. D. No. 395 1/2	Total Height No. 395 1/2	Diameter Flanges
Inches	Each	Each	Inches	Inches	Inches	Inches	Inches
2	10.00		5 1/2	5 3/8	6	5 1/2	6
2 1/2	11.00		6 1/4	6 1/8	7	6 3/8	7
3	12.00	13.00	7	6 3/4	7 1/2	7	7 1/2
3 1/2	13.00	14.00	8 7/8	8 3/4	8 7/8	9 1/8	8 1/2
4	14.00	15.00	8 7/8	8 3/4	9	9 1/8	9
5	15.00	16.00	10 1/2	10 5/8	10 1/2	11 3/8	10
6	18.00	20.00	11 3/4	11 3/4	11 3/4	12 3/4	11
7	35.00	37.00	13 1/8	10 3/4	13 3/8	11 3/8	12 1/2
8	45.00	48.00	15 1/4	12 1/4	15 1/4	13 1/4	13 1/2

These Valves are made to order only.

Brass Foot Valves, with Strainer, page 32.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD FOOT VALVES

IRON BODY

WITH STRAINER

LEATHER DISC



STYLE, SIZES  $\frac{3}{4}$  INCH  
TO 6 INCH



STYLE, SIZES 7 INCH  
TO 16 INCH

Size Inches	Price No. 394, Screwed Each	Price No. 394, Gal- vanized Each	Price No. 395, Flanged Each	Price No. 395, Gal- vanized Each	Largest O. D. No. 394 Inches	Total Height No. 394 Inches	Largest O. D. No. 395 Inches	Total Height No. 395 Inches	Di- ameter Flanges Inches
$\frac{3}{4}$	1.15	1.75			$3\frac{3}{4}$	$3\frac{1}{2}$			
1	1.30	2.00			$3\frac{3}{4}$	$3\frac{1}{2}$			
$1\frac{1}{4}$	1.40	2.10			$4\frac{1}{2}$	$3\frac{3}{4}$			
$1\frac{1}{2}$	1.90	2.85			$5\frac{1}{4}$	$4\frac{1}{2}$			
2	2.40	3.60	3.50	5.50	$5\frac{1}{2}$	$5\frac{3}{8}$	6	$5\frac{1}{2}$	6
$2\frac{1}{2}$	3.30	5.00	4.50	7.00	$6\frac{1}{4}$	$6\frac{1}{8}$	7	$6\frac{3}{8}$	7
3	3.90	5.75	5.75	9.00	7	$6\frac{3}{4}$	$7\frac{1}{2}$	7	$7\frac{1}{2}$
$3\frac{1}{2}$	5.60	8.50	7.50	12.00	$8\frac{7}{8}$	$8\frac{3}{4}$	$8\frac{7}{8}$	$9\frac{1}{8}$	$8\frac{1}{2}$
4	7.30	11.00	9.50	15.00	$8\frac{7}{8}$	$8\frac{3}{4}$	9	$9\frac{1}{8}$	9
$4\frac{1}{2}$	10.50	15.75	13.00	20.00	$10\frac{1}{2}$	$10\frac{5}{8}$	$10\frac{1}{2}$	$11\frac{3}{8}$	$9\frac{1}{4}$
5	11.25	16.75	14.00	22.00	$10\frac{1}{2}$	$10\frac{5}{8}$	$10\frac{1}{2}$	$11\frac{3}{8}$	10
6	14.75	22.00	17.50	27.00	$11\frac{3}{4}$	$11\frac{3}{4}$	$11\frac{3}{4}$	$12\frac{3}{4}$	11
7	35.00	53.00	38.00	57.00	$13\frac{1}{8}$	$10\frac{3}{4}$	$13\frac{1}{8}$	$11\frac{3}{8}$	$12\frac{1}{2}$
8	41.00	62.00	45.00	72.00	$14\frac{1}{4}$	$12\frac{1}{4}$	$15\frac{1}{4}$	$13\frac{1}{4}$	$13\frac{1}{2}$
10	64.00	110.00	70.00	120.00	$19\frac{5}{8}$	$18\frac{1}{2}$	$19\frac{5}{8}$	$18\frac{1}{2}$	16
12	100.00	155.00	112.00	170.00	$20\frac{1}{4}$	$16\frac{3}{4}$	$20\frac{1}{4}$	18	19
14			150.00				$24\frac{1}{8}$	$19\frac{3}{4}$	21
15			175.00				$25\frac{1}{4}$	$21\frac{3}{4}$	$22\frac{1}{4}$
16			200.00				27	$24\frac{1}{2}$	$23\frac{1}{2}$

These Valves, as constructed, insure free openings.

Can be furnished with brass disc in place of leather disc, at an extra price.

Brass Foot Valves, with Strainer, page 32.

Templates for drilling, page 650. Price List for drilling, page 141.

FOOT VALVES

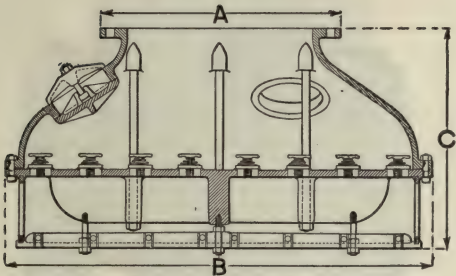
IRON BODY

WITH MULTIPLE DISCS

RUBBER VALVES

BRONZE SPRINGS

CAST IRON STRAINER



No. 397. FLANGED

Size.....Inches	16	18	20	24	30	36
Price.....Each	190.00	235.00	265.00	400.00	780.00	1200.00

Valves with Brass Seats will be made to order at a special price.

DIMENSIONS

Size.....Inches	16	18	20	24	30	36
A—Diameter of Flanges....Inches	23½	25	27½	32	38¾	45¾
B—Greatest Diameter.....Inches	34¾	40¾	46	54½	69½	82
C—Height.....Inches	17¾	21⅞	24	29	35	38¾
Thickness of Flange.....Inches	1⅜	1¼	1⅜	1⅞	1¾	1⅞

Templates for drilling, page 650. Price List for drilling, page 141.

## EXTRA HEAVY SWING CHECK VALVES

FERROSTEEL

HARD METAL SEATS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE A



MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	2	2½	3	3½	4	4½	5
No. 38 E, Screwed.....Each	15.00	20.00	28.00	36.00	41.00	49.00	54.00
No. 39 E, Flanged.....Each	17.00	22.00	30.00	38.00	44.00	52.00	57.00
End to End, Screwed..Inches	9½	10¾	11¾	12¼	13	14	15
Face to Face, Flanged..Inches	10½	11½	12½	13¼	14	15	15¾
Diameter Flanges.....Inches	6½	7½	8¼	9	10	10½	11
Size.....Inches	6	7	8	10	12	14	15
No. 38 E, Screwed.....Each	66.00	84.00	100.00	170.00			
No. 39 E, Flanged.....Each	70.00	88.00	105.00	175.00	250.00	350.00	350.00
End to End, Screwed..Inches	16½	18¼	20	23¼			
Face to Face, Flanged..Inches	17½	19¼	21	24½	28	33	33
Diameter Flanges.....Inches	12½	14	15	17½	20½	23	24½

## EXTRA HEAVY HYDRAULIC SWING CHECK VALVES

FERROSTEEL

HARD METAL SEATS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

2 AND 2½ INCH, 1200 LBS. HYDROSTATIC; 3 AND 4 INCH, 1000 LBS.  
HYDROSTATIC; 5 TO 12 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE



No. 221 H

MAY BE USED IN HORIZONTAL POSITION OR FOR UPWARD FLOW

Size.....Inches	2	2½	3	4	5
No. 220 H, Screwed.....Each	25 00	30.00	40.00	55.00	75.00
No. 221 H, Flanged.....Each	25.00	30.00	40.00	55.00	75.00
End to End, Screwed...Inches	10½	12	13½	15¼	17¼
Face to Face, Flanged..Inches	11½	12½	14	16	18
Diameter of Flanges....Inches	7½	8¾	10	11½	13½
Size.....Inches	6	7	8	10	12
No. 220 H, Screwed.....Each	110.00				
No. 221 H, Flanged.....Each	110.00	150.00	190.00	240.00	350.00
End to End, Screwed...Inches	19	21	24½	26½	
Face to Face, Flanged..Inches	20	22	26	30	34
Diameter of Flanges....Inches	15	16	17	21	23½

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

We do not recommend the use of screwed valves larger than 6 inch.

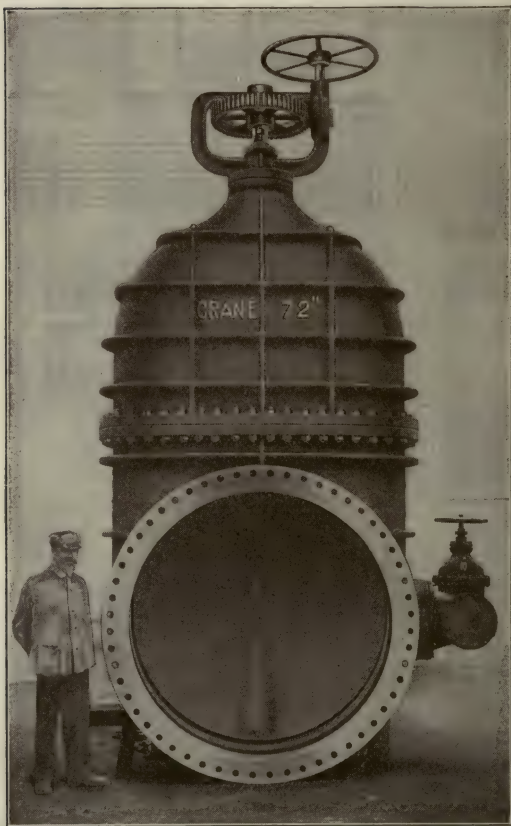
Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

The length Face to Face of Male or Female Flanged Valves is measured from the face of the Flange and not from tongue or recess.

Templates for drilling, page 653. Price List for drilling, page 157.



ILLUSTRATION OF  
72 INCH LOW PRESSURE  
GATE VALVE  
OPERATED WITH SPUR GEARS



This Valve was installed in the City Water Works System of Tacoma, Washington.

Weight, 32,240 pounds.

Height, over all, 17 feet 8 inches.

# **LOW PRESSURE GATE VALVES**

IRON BODY

PATENTED

BRASS TRIMMINGS

OPEN TO THE LEFT

NON-RISING STEM

WEDGE GATE

**FOR STEAM WORKING PRESSURES UP TO 25 POUNDS  
FOR WATER WORKING PRESSURES UP TO 50 POUNDS**

TESTED TO 50 POUNDS HYDRAULIC PRESSURE



No. 491

Size.....Inches	12	14	16	18	20	22	24	26
Price.....Each	120.00	165.00	215.00	300.00	345.00	475.00	540.00	740.00
Price, with Gear. Each							665.00	900.00

Size.....Inches	28	30	32	34	36	*42	*48	
Price.....Each	875.00	1025.00	1125.00	1200.00	1450.00	1900.00	2800.00	
Price, with Gear. Each	1075.00	1250.00	1375.00	1475.00	1750.00	2250.00	3200.00	

\*These sizes are always furnished geared, unless otherwise ordered.  
The stem in these Valves is made of Brass.

These Valves are suitable for Low Pressure and Exhaust Steam, Vacuum Lines, etc.

When wanted for gas, we will furnish **ALL IRON VALVES** at a special price.

**LARGER SIZES, PRICES ON APPLICATION**

For general dimensions, see page 667.

Templates for drilling, page 650. Price List for drilling, page 141.

## LOW PRESSURE GATE VALVES

IRON BODY

PATENTED

BRASS TRIMMINGS

OPEN TO THE LEFT

RISING STEM

WEDGE GATE

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS  
FOR WATER WORKING PRESSURES UP TO 50 POUNDS

TESTED TO 50 POUNDS HYDRAULIC PRESSURE



**No. 493. FLANGED**

Size.....Inches	12	14	16	18	20	22	24	26
Price.....Each	150.00	200.00	255.00	340.00	395.00	535.00	610.00	820.00
Size.....Inches	28	30	32	34	36	42*	48*	
Price.....Each	965.00	1125.00	1250.00	1350.00	1650.00	2150.00	3100.00	

\*Always furnished geared unless otherwise ordered.

The stems in these Valves are made of Steel, plated. Brass stems, when so ordered, will be furnished at an extra price.

These Valves are suitable for Low Pressure and Exhaust Steam, Vacuum Lines, etc.

These Valves are fitted with outside screw which indicates whether the Valve is open, partly open or closed.

LARGER SIZES, PRICES ON APPLICATION

For general dimensions, see page 667.

Templates for drilling, page 650. Price List for drilling, page 141.

# LOW PRESSURE WATER GATE VALVES

HUB ENDS

FOR WOOD PIPE

IRON BODY

BRASS TRIMMINGS

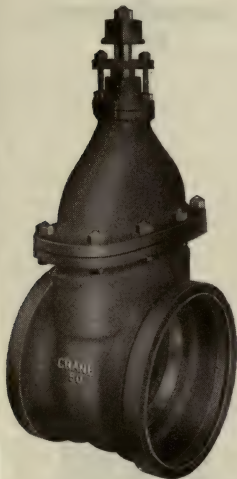
WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR WATER WORKING PRESSURES UP TO 50 POUNDS

TESTED TO 50 POUNDS HYDRAULIC PRESSURE



No. 498 HUB

Size.....Inches			4	6	8	10	12	14
Price.....Each			18.50	30.50	50.00	82.00	120.00	165.00
Size.....Inches	16	18	20	24	30	36	*42	*48
Price.....Each	215.00	300.00	345.00	540.00	1025.00	1450.00	1900.00	2800.00
Price, With Gear, Without By-Pass. Each				665.00	1250.00	1750.00	2250.00	3200.00

\*These sizes are always furnished geared unless otherwise ordered.

The Hub Ends of these Valves have the same construction and inside diameter of hub as our No. 462 Standard Water Gates, and may be used with either Cast Iron or Wood Pipe—however, where diameters of hubs given in table, page 667, are not suitable, the required diameters will be furnished on Valves at a special price.

Hubs are usually furnished rough—if bored hubs are required, orders should so specify. Prices upon application.

LARGER SIZES, PRICES ON APPLICATION

For general dimensions, see page 667.

# STANDARD GATE VALVES

IRON BODY

BRASS TRIMMINGS

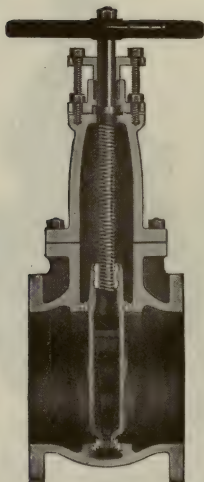
WEDGE GATE

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS

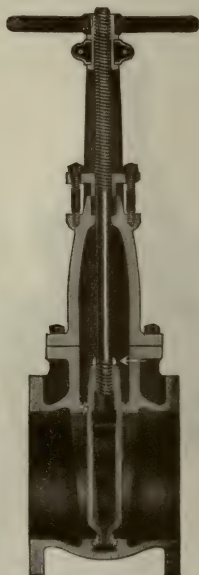
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 461

NON-RISING STEM



No. 465

OUTSIDE SCREW AND YOKE

THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE

TO DO SO WITH NON-RISING STEM VALVES, open the Valve wide by running the wedge tightly up to top of bonnet, which, in turn, draws the collar of stem down tightly to the top flange of bonnet, forming a steam or water tight joint.

OUTSIDE SCREW AND YOKE VALVES. The arrow in above sectional view shows how the joint is made at stuffing box when packing this style Valve. The stem is screwed out until the taper collar on stem engages with and forms a tight joint at the top of bonnet.

Flanged Valves will always be furnished smooth faced, and not drilled, unless otherwise ordered.

The dimensions of Flanges of our Standard and Low Pressure Valves and Flanged Fittings are the American Standard.



## STANDARD GATE VALVES

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

### FOR STEAM WORKING PRESSURES

SIZES 18 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

### FOR WATER WORKING PRESSURES. SEE PAGE A

These Valves are tested to 150 pounds hydraulic pressure with the Valve closed, and we have at various times subjected them to a hydraulic pressure, without leaking, as follows:

Size.....	2 to 16 inch.	18 to 24 inch.	30 inch.
Tight at.....	500 pounds.	300 pounds.	250 pounds.

### BREAKING STRENGTH

We have at various times broken an assortment of sizes under hydraulic pressure and found the following result:

Size.....	4 to 8 inch.	10 to 16 inch.
Burst at.....	1000 to 1500 pounds	900 pounds.

#### SIZES 18 TO 30 INCHES.

The larger sizes, 18 to 30 inch, we have not burst, but have subjected the 18 inch to 450 pounds pressure, and the 20 to 30 inch to 300 pounds pressure without bursting casting.

It will seem that the factor of safety is very high, but they not only have to stand the strain due to the working pressure, but are also liable to unusual strains such as expansion and contraction, water hammer, weight of piping, settling, etc., and for this reason we keep the limit of the working pressure for which we recommend them, down to a perfectly safe point.

It is, however, possible that these Standard Valves might be reasonably satisfactory for a much higher working pressure, provided the expansion, contraction, weight of piping and settling were all taken care of.

Still, the cutting effect of the steam on the disc and seats would render these Valves less durable THAN THE VALVES WHICH WE RECOMMEND FOR A HIGHER PRESSURE OF STEAM.

The guides on the disc and ribs in the body are so finished and fitted as to insure true and easy movement of disc and prevent wear of the faces; and also prevent the disc from touching the seats of the body of the Valves, except at point of closing.

The seats in the body of Valves and faces of discs are made of brass.

The Stem in the Valve with inside screw is made of Brass and in the Valve with outside screw and yoke, is made of Steel, and plated; Brass Stem for the latter Valves will be furnished at an extra price.

The stuffing box flange on all Hub End Valves is made of Malleable Iron with a brass follower, which give additional strength and durability at this point, and a particularly desirable feature on Water Service Valves.

The construction is such that the Valves may be packed when open, without steam escaping. To do so, have Valve wide open. See explanatory cuts on following page.

All users of Valves will appreciate the advantage in being able to repack a Valve without shutting off steam, as it frequently happens that it is necessary that they be kept in continuous use.

VALVES FOR AIR OR GAS SERVICE WILL BE GIVEN A SPECIAL AIR TEST. PRICES ON APPLICATION.

WATER GATES ARE GIVEN A SPECIAL TEST OF 300 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

# STANDARD GATE VALVES

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



Size.....Inches	2	2½	3	3½	4	4½	5	
No. 460, Screwed.....Each	10.00	11.50	14.00	17.00	19.00	24.00	27.5	
No. 461, Flanged.....Each	12.00	13.50	16.50	19.50	23.00	28.00	31.5	
E. to E., Screwed.....Inches	5 <sup>7</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	6½	6 <sup>5</sup> / <sub>8</sub>	7¼	7 <sup>7</sup> / <sub>8</sub>	
F. to F., Flanged.....Inches	7	7½	8	8½	9	9½	10	
Diam. Flanges. ....Inches	6	7	7½	8½	9	9¼	10	
Size.....Inches	6	7	8	9	10	12	14	15
No. 460, Screwed..Each	32.50	45.00	54.00	76.00	90.00	125.00		
No. 461, Flanged..Each	36.50	49.00	58.00	81.00	95.00	133.00	181.00	220.0
E. to E., Screwed.Inches	7¾	8¼	8½	9¼	9⅞	11⅞		
F. to F., Flanged.Inches	10½	11	11½	12	13	14	15	15
Diam. Flanges ..Inches	11	12½	13½	15	16	19	21	22½
Size.....Inches	16	18	20	22	24	26	28	30
No. 461, Flanged..Each	260.00	350.00	425.00	530.00	600.00	800.00	950.00	1100.0
F. to F., Flanged.Inches	16	17	18	19	20	23	26	30
Diam. Flanges ..Inches	23½	25	27½	29½	32	34¼	36½	38¾

For general dimensions, see page 669.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD GATE VALVES WITH OUTSIDE SCREW AND YOKE

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

OPEN TO THE LEFT

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



The outside screw and yoke indicates whether the Valve is open, partly open or closed.

For general dimensions, see page 669.

Templates for drilling, page 650.  
Price List for drilling, page 141.

Size . . . . . Inches	2	2½	3	3½	4	4½
No. 464, with Steel Stem, Screwed. Each	17.50	19.00	22.00	25.00	30.00	37.00
No. 465, with Steel Stem, Flanged. Each	19.50	21.00	24.50	27.50	34.00	41.00
No. 464½, with Brass Stem, Scrd.. Each	19.00	20.50	23.50	27.00	32.50	40.00
No. 465½, with Brass Stem, Flgd.. Each	21.00	22.50	26.00	29.50	36.50	44.00
Size . . . . . Inches	5	6	7	8	9	10
No. 464, with Steel Stem, Screwed. Each	42.00	48.00	64.00	80.00	105.00	122.00
No. 465, with Steel Stem, Flanged. Each	46.00	52.00	68.00	84.00	110.00	127.00
No. 464½, with Brass Stem, Scrd.. Each	45.00	52.00	69.00	86.00	113.00	131.00
No. 465½, with Brass Stem, Flgd.. Each	49.00	56.00	73.00	90.00	118.00	136.00
Size . . . . . Inches	12	14	15	16	18	20
No. 464, with Steel Stem, Screwed. Each	160.00					
No. 465, with Steel Stem, Flanged. Each	168.00	236.00	285.00	325.00	435.00	525.00
No. 464½, with Brass Stem, Scrd.. Each	172.00					
No. 465½, with Brass Stem, Flgd.. Each	180.00	255.00	310.00	350.00	470.00	565.00
Size . . . . . Inches	22	24	26	28	30	
No. 465, with Steel Stem, Flanged. Each	650.00	725.00	950.00	1125.00	1300.00	
No. 465½, with Brass Stem, Flgd.. Each	700.00	775.00	1025.00	1210.00	1400.00	

# STANDARD GATE VALVES

## WATER GATES

IRON BODY

BRASS TRIMMINGS

WEDGE GAT

OPEN TO THE LEFT

NON-RISING STEM

### FOR WATER WORKING PRESSURES

SIZES 12 INCH AND SMALLER, UP TO 175 POUNDS

SIZES 14 AND 16 INCH, UP TO 150 POUNDS

SIZES 18 INCH AND LARGER, UP TO 120 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE



No. 462 HUB

Size.....Inches	2	3	4	5	6	7	8	10
Price.....Each	10.00	14.00	19.00	27.50	32.50	45.00	54.00	90.00
For Matheson or Converse Joint Pipe.....Each			19.00		32.50		54.00	90.00
End to End.....Inches	8 $\frac{1}{2}$	9	10 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{3}{4}$	10 $\frac{3}{4}$	12	12 $\frac{3}{4}$
Size.....Inches	12	14	16	18	20	24	30	
Price.....Each	125.00	173.00	250.00	340.00	415.00	590.00	1075.00	
Price, with By-Pass...Each			315.00	415.00	500.00	690.00	1225.00	
End to End.....Inches	13 $\frac{1}{2}$	13 $\frac{3}{4}$	16	17	17	18	30	

These Valves will be furnished "Open to the Right" when so ordered at same price.

All Valves 20 inch and smaller have 2 inch square head on stem; 24 inch and larger have 3 inch square head on stem. Stuffing boxes have bolted followers.

These Valves are suitable for use with Cast Iron or Wood Pipe — however, where diameters of hubs given in table, page 669, are not suitable, the required diameters will be furnished on valves at a special price.

Hubs are usually furnished rough — if bored hubs are required orders should so specify.

For general dimensions, see page 669.

# STANDARD GATE VALVES OPERATED WITH GEARING

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS

SIZES 18 INCH AND LARGER, UP TO 100 POUNDS



For Water Working  
Pressures,  
see page A



## No. 463. FLANGED WITH SPUR GEARS WITH BEVEL GEARS

Size.....Inches	16	18	20	22	24	26
Price, Flanged.....Each	360.00	460.00	550.00	675.00	750.00	1000.00
Price, Flanged, with By-Pass....Each	425.00	535.00	635.00	775.00	850.00	1125.00
Price, Hub Ends.....Each	350.00	450.00	540.00		740.00	
Price, Hub Ends, with By-Pass..Each	415.00	525.00	625.00		840.00	
Face to Face, Flanged..Inches	16	17	18	19	20	23
Diameter of Flanges....Inches	23½	25	27½	29½	32	34¼
Size.....Inches	28	30	36	42	48	
Price, Flanged.....Each	1200.00	1400.00	2100.00	3150.00	4300.00	
Price, Flanged, with By-Pass....Each	1350.00	1550.00	2300.00	3400.00	4600.00	
Price, Hub Ends.....Each		1375.00	2050.00	3100.00	4250.00	
Price, Hub Ends, with By-Pass..Each		1525.00	2250.00	3350.00	4550.00	
Face to Face, Flanged..Inches	26	30	36			
Diameter of Flanges....Inches	36½	38¾	45¾			

In ordering, state whether Spur or Bevel Gearing is wanted.

Prices for larger sizes or sizes not listed, upon application.

Hub End Valves are always furnished with square stem nut instead of hand wheel unless otherwise ordered.

For illustrations of Various Styles of Gearing, see page 188.

Templates for drilling, page 650. Price List for drilling, page 141.



# STANDARD GATE VALVES WITH INDICATOR

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 469. FLANGED

Size.....Inches	2½	3	3½	4	5
Price.....Each	21.00	24.50	27.50	34.00	46.00
Face to Face.....Inches	7½	8	8½	9	10
Diameter of Flanges.....Inches	7	7½	8½	9	10
Size.....Inches	6	7	8	10	12
Price.....Each	52.00	68.00	84.00	127.00	168.00
Face to Face.....Inches	10½	11	11½	13	14
Diameter of Flanges.....Inches	11	12½	13½	16	19

The Indicator Attachment enables the operator at a glance to determine the position of Valve, whether open, partly open or closed.

The Indicator is so designed that it may be turned to face any of the four sides of the Valve. The Indicator shield and traveling-nut are made of brass.

The plate bearing the words "open" and "shut," is made of aluminum with black background and polished letters.

These Valves are designed in accordance with the rules and requirements recommended by the NATIONAL FIRE PROTECTION ASSOCIATION.

These Valves are especially recommended for use on Sprinkler Systems.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD GATE VALVES QUICK OPENING

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

SLIDING STEM

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 471

Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 470, Screwed...Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00	48.00
No. 471, Flanged...Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00	52.00
End to End, Screwed...Inches	5⅞	5⅞	6⅞	6½	6⅞	7¼	7⅝	7¾
Face to Face, Flanged..Inches	7	7½	8	8½	9	9½	10	10½
Diam. of Flanges.Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
No. 470, Screwed...Each	64.00	80.00	105.00	122.00	160.00			
No. 471, Flanged...Each	68.00	84.00	110.00	127.00	168.00	236.00	285.00	325.00
End to End, Screwed...Inches	8¼	8⅞	9¼	9⅞	11⅝			
Face to Face, Flanged..Inches	11	11½	12	13	14	15	15	16
Diam. of Flanges.Inches	12½	13½	15	16	19	21	22¼	23½

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD—ALL IRON GATE VALVES

OPEN TO THE LEFT

WEDGE GATE

NON-RISING STEM



Size.....	Inches	2	2½	3	3½	4
No. 472, Screwed.....	Each	10.00	11.50	14.00	17.00	19.00
No. 473, Flanged.....	Each	12.00	13.50	16.50	19.50	23.00
End to End, Screwed.....	Inches	5½	5¾	6⅛	6½	6¾
Face to Face, Flanged.....	Inches	7	7½	8	8½	9
Diameter of Flanges.....	Inches	6	7	7½	8½	9

Size.....	Inches	4½	5	6	7	8	9
No. 472, Screwed.....	Each	24.00	27.50	32.50	45.00	54.00	76.00
No. 473, Flanged.....	Each	28.00	31.50	36.50	49.00	58.00	81.00
End to End, Screwed.....	Inches	7¼	7⅝	7¾	8¼	8⅞	9¼
Face to Face, Flanged.....	Inches	9½	10	10½	11	11½	12
Diameter of Flanges.....	Inches	9¼	10	11	12½	13½	15

Size.....	Inches	10	12	14	15	16	
No. 472, Screwed.....	Each	90.00	125.00				
No. 473, Flanged.....	Each	95.00	133.00	181.00	220.00	260.00	
End to End, Screwed.....	Inches	9⅞	11⅝				
Face to Face, Flanged.....	Inches	13	14	15	15	16	
Diameter of Flanges.....	Inches	16	19	21	22¼	23½	

For general dimensions, see page 669.

Templates for drilling, page 650. Price List for drilling, page 141.

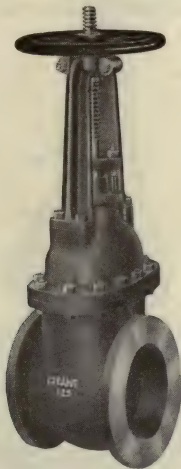
# STANDARD—ALL IRON

## GATE VALVES

OPEN TO THE LEFT

WEDGE GATE

RISING STEM

No. 475 $\frac{1}{2}$ 

Size.....Inches	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5
No. 475, with Steel Stem, Serd. . Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00
No. 475 $\frac{1}{2}$ , with Steel Stem, Flgd. Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00
Size.....Inches	6	7	8	9	10	12	
No. 475, with Steel Stem, Serd. . Each	48.00	64.00	80.00	105.00	122.00	160.00	
No. 475 $\frac{1}{2}$ , with Steel Stem, Flgd. Each	52.00	68.00	84.00	110.00	127.00	168.00	

For general dimensions, see page 669.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD GATE VALVES

## WATER GATES

IRON BODY

BRASS TRIMMINGS

WEDGE GATE

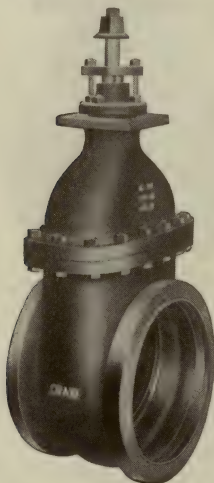
OPEN TO THE LEFT

NON-RISING STEM

FOR FIRE PROTECTION SERVICE, UNDERWRITERS' PATTERN

FOR WATER WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE



No. 462½ HUB

Size.....Inches	4	6	8	10	12
Price.....Each	19.00	32.50	54.00	90.00	125.00
End to End.....Inches	10¼	10¾	12	12¾	13½

These Valves are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

These Valves are marked "CU" to denote their use for fire protection service.

The Indicator Post Flange is cast on the bonnet.

For general dimensions, see page 669.



# STANDARD GATE VALVES

## WITH OUTSIDE SCREW AND YOKE

IRON BODY

BRASS TRIMMINGS

BRASS STEM

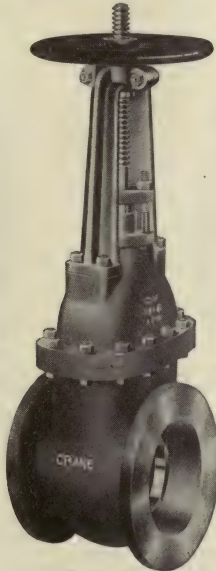
OPEN TO THE LEFT

WEDGE GATE

FOR FIRE PROTECTION SERVICE, UNDERWRITERS' PATTERN

FOR WATER WORKING PRESSURES UP TO 150 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE



The outside screw and yoke indicates whether the Valve is open, partly open or closed.

For general dimensions, see page 669.

Templates for drilling, page 650.

Price List for drilling, page 141.

**No. 467. FLANGED**

Size .....	Inches	2½	3	3½	4	5	6
Price .....	Each	22.50	26.00	29.50	36.50	49.00	56.00
Size .....	Inches	7	8	10	12	14	
Price .....	Each	73.00	90.00	136.00	180.00	255.00	

Screwed Valves will be made to order at the same price as flanged.

These Valves are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

These Valves are marked "CU" to denote their use for fire protection service.

For Valves with Indicator, see page 134.

## STANDARD GATE VALVES

DOUBLE DISC

CRANE SPECIAL BRASS PARALLEL SEATS

IRON BODY

FOR STEAM WORKING PRESSURES

SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS

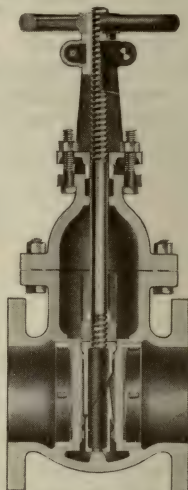
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 481 FLANGED

OPEN  
TO THE LEFT



No. 483 FLANGED

### PRICE LIST. NON-RISING STEM VALVES

Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 480, Screwed..Each	10.00	11.50	14.00	17.00	19.00	24.00	27.50	32.50
No. 481, Flanged..Each	12.00	13.50	16.50	19.50	23.00	28.00	31.50	36.50
Size.....Inches	8	10	12	14	16	18	20	24
No. 480, Screwed..Each	54.00	90.00	125.00					
No. 481, Flanged..Each	58.00	95.00	133.00	181.00	260.00	350.00	425.00	600.00

THESE VALVES ARE USED EXTENSIVELY FOR HOT WATER WASHOUT SYSTEMS AND IN WATER CONSERVING PLANTS.

### PRICE LIST. RISING STEM VALVES

Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 482, Screwed..Each	17.50	19.00	22.00	25.00	30.00	37.00	42.00	48.00
No. 483, Flanged..Each	19.50	21.00	24.50	27.50	34.00	41.00	46.00	52.00
Size.....Inches	8	10	12	14	16	18	20	24
No. 482, Screwed..Each	80.00	122.00	160.00					
No. 483, Flanged..Each	84.00	127.00	168.00	236.00	325.00	435.00	525.00	725.00

For general dimensions, see page 674.

Templates for drilling, page 650. Price List for drilling, page 141.

### VALVES FOR WOOD PRESERVING PLANTS

When these Valves are to be used in Wood Preserving Plants, they will be furnished with Monel Metal Trimmings and Stems.

PRICES ON APPLICATION

# **PRICE LIST FOR DRILLING STANDARD AND LOW PRESSURE FLANGED VALVES**

Size Inches	Drilling Valves with 2 Flanges except Angle Valves Each	Drilling Angle Valves Each	Drilling Cross Valves and Cross Safety Valves Each
¾	.60	1.00	1.20
1	.60	1.00	1.20
1¼	.60	1.00	1.20
1½	.60	1.00	1.20
2	.75	1.25	1.50
2½	.75	1.25	1.50
3	.75	1.25	1.50
3½	1.00	1.50	2.00
4	1.25	1.75	2.50
4½	1.50	2.00	3.00
5	1.50	2.00	3.00
6	1.75	2.50	3.50
7	2.25	3.00	4.50
8	2.25	3.00	4.50
9	2.50	3.50	5.00
10	2.50	3.50	5.00
12	3.50	5.00	7.00
14	4.00	6.00	
15	4.50	6.50	
16	5.00	7.00	
18	6.00	10.00	
20	7.50	12.00	
22	9.00	14.00	
24	10.00	16.00	
26	11.00	18.00	
28	12.00	20.00	
30	12.00	22.00	
32	12.00	22.00	
34	14.00	24.00	
36	14.00	24.00	
42	25.00		
48	30.00		

**BOLT HOLES WILL NOT BE SPOT FACED UNLESS SO ORDERED, WHEN AN  
EXTRA CHARGE OF FIVE CENTS, NET, PER HOLE WILL BE MADE.**

**FOR DRILLING TEMPLATES, SEE PAGE 650**

## MEDIUM GATE VALVES

FERROSTEEL BODY

CRANE SPECIAL BRASS SEATS

WEDGE GATE

FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO  
SIZE, VIZ.:

STEAM	{	SIZES 16 INCH AND SMALLER. UP TO 175 POUNDS
		SIZES 18 INCH AND LARGER . UP TO 150 POUNDS
WATER	{	SIZES 12 INCH AND SMALLER. UP TO 250 POUNDS
		SIZES 14 INCH AND LARGER . UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

ACTUAL BURSTING PRESSURES OF CAST IRON MEDIUM GATE VALVES

Sizes, 4 to 8 inch; 1200 to 1900 Pounds	Sizes, 10 and 12 inch; 850 Pounds
---	-----------------------------------

ACTUAL BURSTING PRESSURES OF FERROSTEEL MEDIUM GATE VALVES

Sizes	Pounds	Sizes	Pounds	Size	Pounds
4 to 8 inch	1900 to 2600	14 inch	O. K. at 1000	18 inch	O. K. at 700
10 and 12 inch	1400 to 1500	16 inch	O. K. at 750		

The above tables of comparative destructive hydraulic tests will be useful as a guidance to engineers in adopting a factor of safety applicable to varying conditions.

The demand for Medium Gate Valves, suitable for a working pressure between our Standard and High Pressure (Extra Heavy Pattern) has been so frequent that we have been induced to make a complete line of patterns to meet the requirements of this trade.

The Body of these Valves, all sizes, is made of Ferrosteel. The Bonnet is made of Ferrosteel in sizes 8 inch and larger.

Their construction is similar to the Standard, except that they are much heavier, and were designed for steam plants carrying pressures up to 175 pounds (sizes 16 inch and smaller), and will be found a very serviceable Valve for the purpose intended.

The STEM in the Valve with inside screw is made of Brass and in the Valve with outside screw and yoke is made of Steel, Plated. Brass stem for the latter Valves will be furnished at an extra price.

The stuffing box flange on all these Valves is made of MALLEABLE Iron, with brass follower, which gives the requisite additional strength and durability at this point.

Each Valve is tested to 500 pounds hydraulic pressure before leaving the factory.

It is desirable that all Valves 6 inch and larger have a By-Pass.

The construction of these Valves is such that they may be packed when open. To do so, have Valve wide open, as shown and explained, page 146.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with  $\frac{1}{16}$  inch raised face, for which we make no extra charge.

This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used, as this gasket draws down to  $\frac{1}{32}$  inch or less and the heavy bolting would (without the raised face) spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

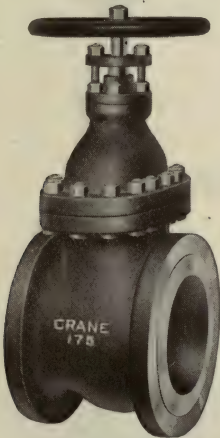
THE MERITS OF CRANE FERROSTEEL ARE DESCRIBED ON PAGE 8

## MEDIUM GATE VALVES

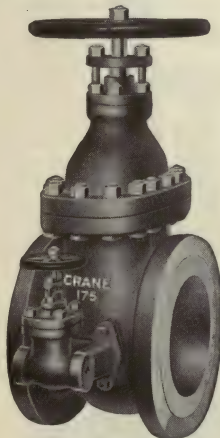
FERROSTEEL BODY      CRANE SPECIAL BRASS SEATS      WEDGE GATE  
 OPEN TO THE LEFT      NON-RISING STEM      PATENTED  
 FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO  
 SIZE, VIZ.:

STEAM { SIZES 16 INCH AND SMALLER . UP TO 175 POUNDS  
           { SIZE 18 INCH . . . . . UP TO 150 POUNDS  
 WATER { SIZES 12 INCH AND SMALLER . UP TO 250 POUNDS  
           { SIZES 14 INCH AND LARGER . UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 501



No. 503

Size.....Inches	2	2½	3	3½	4	4½	5	6	7
No. 500, Screwed . . Each	15.00	17.00	20.00	25.00	28.00	35.00	40.00	50.00	75.00
No. 501, Flanged . . Each	17.50	19.50	23.00	28.00	33.00	40.00	45.00	57.00	82.00
No. 503, Flanged . . Each								85.00	110.00
Size.....Inches	8	9	10	12	14	15	16	18	
No. 500, Screwed . . Each	87.00	120.00	145.00	185.00					
No. 501, Flanged . . Each	94.00	127.00	153.00	195.00	300.00	350.00	400.00		
No. 503, Flanged . . Each	125.00	158.00	185.00	230.00	340.00	390.00	450.00	575.00	

We do not recommend the use of screwed Valves larger than 6 inch. It is desirable that Valves 6 inch and larger have a By-Pass.

For general dimensions, see page 671.

Templates for drilling, page 652. Price List for drilling, page 152.

WE HAVE PATTERNS AND CAN FURNISH PROMPTLY, SIZES UP TO AND INCLUDING 24 INCH. PRICES ON APPLICATION.



## MEDIUM GATE VALVES

FERROSTEEL BODY

CRANE SPECIAL BRASS SEATS

WEDGE GATE

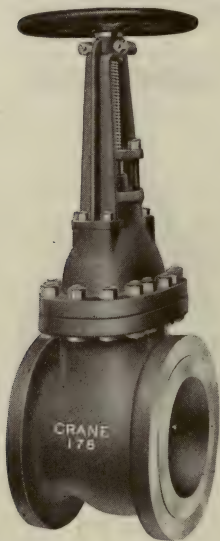
OPEN TO THE LEFT

PATENTED

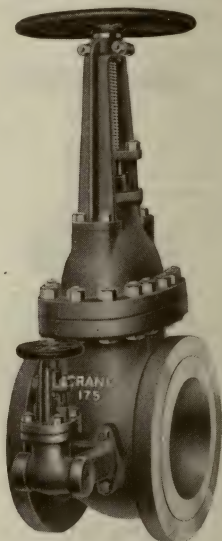
FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO  
SIZE, VIZ.:

STEAM { SIZES 16 INCH AND SMALLER . UP TO 175 POUNDS  
SIZES 18 INCH AND LARGER . UP TO 150 POUNDS  
WATER { SIZES 12 INCH AND SMALLER . UP TO 250 POUNDS  
SIZES 14 INCH AND LARGER . UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 505



No. 507

Size...Inches	2	2½	3	3½	4	4½	5	6	7	8
No. 504, Serd. Each	23.00	25.00	29.00	35.00	40.00	50.00	54.00	65.00	90.00	110.00
No. 505, Flgd. Each	25.50	27.50	32.00	38.00	45.00	55.00	59.00	72.00	97.00	117.00
No. 507, Flgd. Each								100.00	125.00	148.00
Size...Inches	9	10	12	14	15	16	18	20	24	
No. 504, Serd. Each	145.00	170.00	215.00							
No. 505, Flgd. Each	152.00	178.00	225.00	340.00	400.00	450.00	600.00	775.00	1175.00	
No. 507, Flgd. Each	183.00	210.00	260.00	390.00	450.00	510.00	660.00	850.00	1250.00	

The outside screw indicates whether Valve is open, partly open or closed.

It is desirable that all Valves 6 inches and larger have a By-Pass.

For general dimensions, see page 671.

Templates for drilling, page 652. Price List for drilling, page 152.

# MEDIUM GATE VALVES

## ANGLE PATTERN

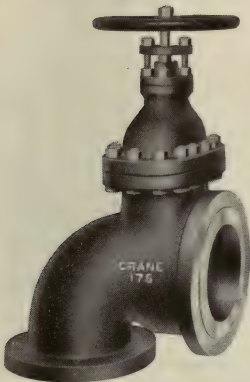
FERROSTEEL BODY  
WEDGE GATE

CRANE SPECIAL BRASS SEATS  
OPEN TO THE LEFT

FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO  
SIZE, VIZ.:

STEAM	{	SIZES 16 INCH AND SMALLER, UP TO 175 POUNDS
		SIZE 18 INCH . . . . . UP TO 150 POUNDS
WATER	{	SIZES 12 INCH AND SMALLER, UP TO 250 POUNDS
		SIZES 14 INCH AND LARGER, UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 511  
NON-RISING STEM



No. 513  
OUTSIDE SCREW AND YOKE

Size.....Inches	4	5	6	7	8	9	10	12
No. 511, Price....Each	65.00	85.00	100.00	130.00	150.00	195.00	225.00	300.00
No. 513, Price....Each	77.00	100.00	115.00	145.00	175.00	220.00	250.00	330.00

These Valves will be furnished, screwed, 12 inch, and smaller at a special price. Other sizes than those listed, prices on application.

When so specified, 6 inch and larger Valves can be fitted with By-Pass.

For general dimensions, see page 671.

Templates for drilling, page 652. Price List for drilling, page 152.

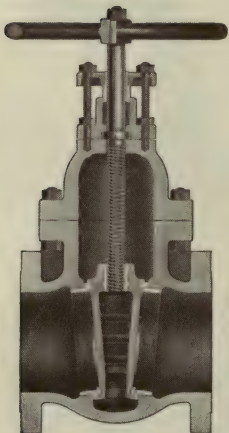
## EXTRA HEAVY GATE VALVES

FERROSTEEL

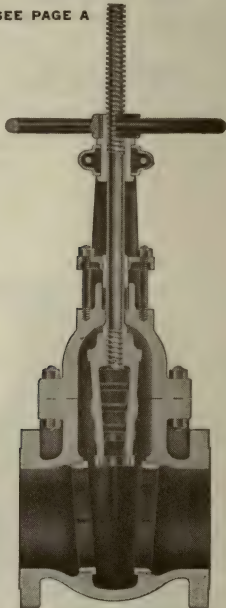
HARD METAL SEATS

WEDGE GATE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS  
TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH  
FOR WATER WORKING PRESSURES, SEE PAGE A



No. 3 E  
NON-RISING STEM



No. 7 E  
OUTSIDE SCREW AND YOKE

**THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE.**

TO DO SO, WITH NON-RISING STEM VALVES, open the Valve wide by running the wedge tightly up to top of bonnet, which in turn draws the collar of stem down tightly to the flange of bonnet, forming a steam or water tight joint. THE OUTSIDE SCREW AND YOKE VALVES; the arrow in above sectional view shows how the joint is made at stuffing box when packing this style Valve. The Stem is screwed out until the taper collar on Stem engages with and forms a tight joint at the top of bonnet.

Unless otherwise specified, we will always furnish our Extra Heavy and Medium Flanged Valves, also our Extra Heavy Companion Flanges and Flanged Fittings, with  $\frac{1}{16}$  inch raised face, for which we make no extra charge. This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used. This gasket draws down to  $\frac{1}{32}$  inch or less and the heavy bolting will spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

## EXTRA HEAVY GATE VALVES

FERROSTEEL

HARD METAL SEATS

WEDGE GATE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

These Valves are tested to 800 pounds hydraulic pressure per square inch with the Valve open, and are also tested with the Valve closed and the pressure against the disc to 500 pounds hydraulic pressure. We have at various times subjected them to a hydraulic pressure with the Valve closed and the pressure against the disc as follows:

Size: 1½ to 8 inch. 10 to 14 inch. 16 and 18 inch. 20 to 24 inch.  
Tight at 1300 pounds. 900 pounds. 800 pounds. 600 pounds.

It will be observed that all sizes up to and including 18 inch are tight with a pressure of 800 pounds against the disc. The 20 inch, 22 inch and 24 inch Valves are tight against 600 pounds, which is as heavy a strain as a Valve of these sizes should be subjected to.

ACTUAL BURSTING PRESSURES OF  
CAST IRON EXTRA HEAVY GATE VALVES

Sizes	Pounds
4 to 8 inch	1600 to 1900
10 and 12 inch	1350 to 1550
14 to 16 inch	1100

ACTUAL BURSTING PRESSURES OF  
FERROSTEEL EXTRA HEAVY GATE VALVES

Sizes	Pounds
4 to 8 inch	2450 to 2600
10 and 12 inch	1750 to 1900
14 to 16 inch	1200 to 1350
18 inch	O. K. at 850
20 to 24 inch	O. K. at 600

THE BODY AND BONNET OF EXTRA HEAVY VALVES ARE MADE OF FERROSTEEL

The above tables of comparative destructive hydraulic tests will be useful as a guidance to engineers in adopting a factor of safety applicable to varying conditions.

The factor of safety used by us is conservatively high but it is not only a question of the goods standing the pressure, but also standing the strains of expansion, contraction, settling, weight of piping and water hammer; also the cutting effect of the steam, as the destruction of the seat of a Valve, which renders it necessary to renew a Valve in a large plant, is a very serious matter. Hence it follows that the brass used in all these Valves should be and is of a superior quality.

### CONSTRUCTION

The body is very heavy and has extra heavy hard metal seats which are screwed to shoulders in body, thereby insuring perfect joints.

This construction of seat and method of screwing it in body is very much better than any other, as there is no necessity of an auxiliary gland to keep the seats in exact line and no trouble with leaks between seat and body, which is liable to occur in other styles. These seats can be removed at any time should it be found necessary to renew them.

The gate is made very stiff and faced with hard metal. The guides in the gate are carefully finished so as to slide smoothly on ribs in body, thus preventing any rattling when Valve is partly open or any uneven wear of the faces.

The stem in the Valve with inside screw is made of Hard Metal, and in the Valve with outside screw and yoke is made of Steel, and plated. Hard Metal Stems for the latter Valves will be furnished at an extra price.

The stuffing box flange on all these Valves is made of Malleable Iron with a brass follower, which gives the requisite additional strength and durability at this point.

The construction of these Valves is such that they may be packed when open. See explanatory cuts on opposite page.

Hard Metal is the very best material that can be made to stand the wear which the seats of these Valves are subjected to.

We can make these Valves with a male face when so desired.

THE MERITS OF CRANE FERROSTEEL ARE DESCRIBED ON PAGE B



## EXTRA HEAVY GATE VALVES

FERROSTEEL

HARD METAL SEATS

WEDGE GATE

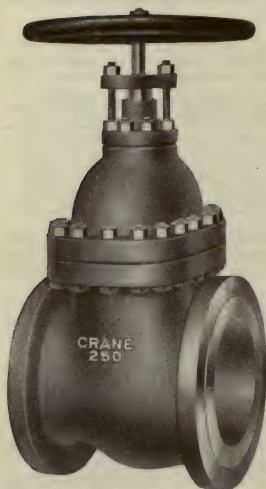
OPEN TO THE LEFT

NON-RISING STEM

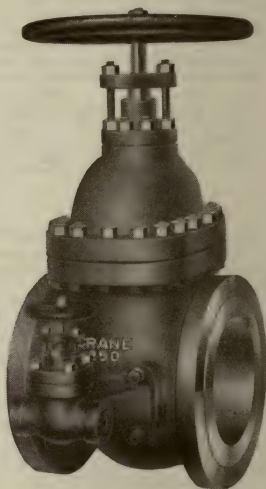
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 3 E



No. 5 E

Size . . . . . Inches	1¼	1½	2	2½	3	3½	4	4½	5
No. 2 E, Screwed . Each	24.00	25.00	27.50	33.00	45.00	57.00	60.00	77.00	85.00
No. 3 E, Flanged . Each	26.50	27.50	30.00	35.50	48.00	60.00	65.00	82.00	90.00
Size . . . . . Inches	6	7	8	9	10	12	14	15	16
No. 2 E, Screwed . Each	100.00	125.00	155.00	225.00	250.00				
No. 3 E, Flanged . Each	107.00	132.00	162.00	232.00	258.00	335.00	440.00	540.00	675.00
No. 5 E, Flanged . Each	155.00		215.00		310.00	400.00			

It is desirable that all Valves, 6 inch and larger, have a By-Pass. We do not recommend the use of Screwed Valves larger than 6 inch.

For general dimensions, see page 673.

Templates for drilling, page 652. Price List for drilling, page 152.



# EXTRA HEAVY GATE VALVES OUTSIDE SCREW AND YOKE

FERROSTEEL

WEDGE GATE.

(PATENTED)

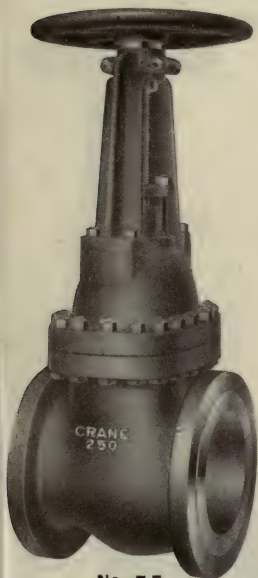
HARD METAL SEATS

OPEN TO THE LEFT

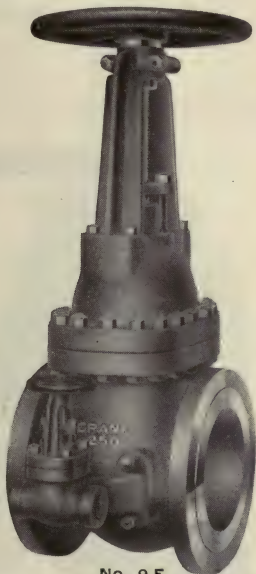
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 7 E



No. 9 E

Size . . . . . Inches	1¼	1½	2	2½	3	3½	4	4½	5
No. 6 E, Screwed . Each				41.00	54.00		72.00		100.00
No. 7 E, Flanged . Each	34.50	35.50	38.00	43.50	57.00	70.00	77.00	97.00	105.00
No. 9 E, Flanged . Each									153.00

Size . . . . . Inches	6	7	8	9	10	12	14	15	16
No. 7 E, Flanged . Each	122.00	147.00	187.00	257.00	283.00	390.00	510.00	610.00	750.00
No. 9 E, Flanged . Each	170.00	195.00	240.00	310.00	335.00	455.00	580.00	680.00	825.00

Size . . . . . Inches	18	20	22	24			
No. 9 E, Flanged . Each	1050.00	1250.00	1575.00	1700.00			

It is desirable that all Valves, 6 inch and larger, have a By-Pass. We do not recommend the use of Screwed Valves larger than 6 inch.

The outside screw indicates whether the Valve is open, partly open or closed. For general dimensions, see page 673.

Templates for drilling, page 652. Price List for drilling, page 152.

## EXTRA HEAVY GATE VALVES

ANGLE PATTERN

RISING AND NON-RISING STEM

FERROSTEEL

HARD METAL SEATS

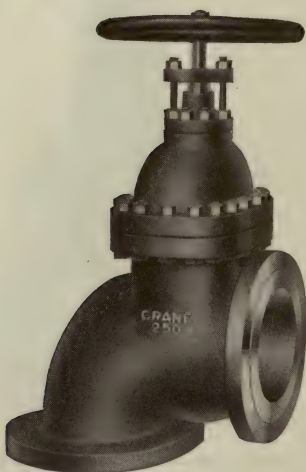
WEDGE GATE

OPEN TO THE LEFT

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 11 E



No. 12 E

Size.....Inches	5	6	7	8	9	10
No. 11 E, Flanged.....Each	140.00	175.00	210.00	250.00	325.00	375.00
No. 11 E, Flanged, with By-Pass.. Each		225.00	260.00	300.00	375.00	430.00
No. 12 E, Flanged.....Each	155.00	190.00	225.00	275.00	350.00	400.00
No. 12 E, Flanged, with By-Pass.. Each				325.00	400.00	455.00

NOTE: IN ORDERING VALVES WITH BY-PASS, STATE WHETHER THE BY-PASS IS TO BE LOCATED ON THE RIGHT OR LEFT HAND SIDE, VIEWED FROM THE FACE OF SIDE OPENING.

The above Valves are made to order only.

Prices of other sizes furnished on application.

For general dimensions, see page 673.

Templates for drilling, page 652. Price List for drilling, page 152.

## EXTRA HEAVY GATE VALVES

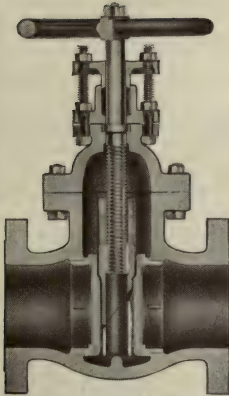
DOUBLE DISC

HARD METAL PARALLEL SEATS

FERROSTEEL BODY

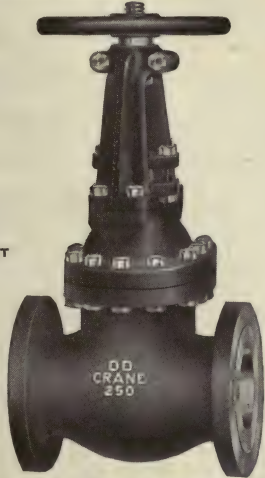
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR WATER WORKING PRESSURES, SEE PAGE A



No. 55 E FLANGED

OPEN  
TO THE LEFT



No. 58 E FLANGED

### PRICE LIST. NON-RISING STEM VALVES

Size.....Inches	2	2½	3	3½	4	4½
No. 54 E, Screwed .....Each	27.50	33.00	45.00	57.00	60.00	77.00
No. 55 E, Flanged .....Each	30.00	35.50	48.00	60.00	65.00	82.00
Size.....Inches	5	6	8	10	12	
No. 54 E, Screwed .....Each	85.00	100.00	155.00	250.00		
No. 55 E, Flanged .....Each	90.00	107.00	162.00	258.00	335.00	

### PRICE LIST. RISING STEM VALVES

Size.....Inches	2	3	4	5
No. 57 E, Screwed .....Each	35.50	54.00	72.00	100.00
No. 58 E, Flanged .....Each	38.00	57.00	77.00	105.00
Size.....Inches	6	8	10	12
No. 57 E, Screwed .....Each	115.00	180.00	275.00	
No. 58 E, Flanged .....Each	122.00	187.00	283.00	390.00

For general dimensions, see page 675.

Templates for drilling, page 652. Price List for drilling, page 152.

### VALVES FOR WOOD PRESERVING PLANTS

When these Valves are to be used in Wood Preserving Plants, they will be furnished with Monel Metal Trimmings and Stems.

PRICES ON APPLICATION

**PRICE LIST FOR DRILLING  
MEDIUM AND EXTRA HEAVY  
CAST IRON AND FERROSTEEL  
FLANGED VALVES**

Size Inches	Drilling Valves with 2 Flanges except Angle Valves Each	Drilling Angle Valves Each	Drilling Cross Valves Each	Drilling Pop Safety Valves 1 Flange Each Valve	Drilling Pop Safety Valves 2 Flanges Each Valve
1	.60	1.00			
1¼	.60	1.00			
1½	.60	1.00			
2	.75	1.25	1.50		
2½	.75	1.25	1.50	.75	1.25
3	.75	1.25	1.50	.75	1.25
3½	1.00	1.50	2.00	1.00	1.50
4	1.25	1.75	2.50	1.25	1.75
4½	1.50	2.00	3.00	1.50	2.00
5	1.50	2.00	3.00	1.50	2.00
6	1.75	2.50	3.50	1.75	2.50
7	2.25	3.00	4.50	For drilling 5½ inch Marine Pop Safety Valves, use 6 inch prices.	
8	2.25	3.00	4.50		
9	2.50	3.50	5.00		
10	2.50	3.50	5.00		
12	3.50	5.00	7.00		
14	4.00	6.00	8.00		
15	4.00	6.00	8.00		
16	5.00	7.00			
18	6.00				
20	7.50				
22	9.00				
24	10.00				
30	12.00				

BOLT HOLES WILL NOT BE SPOT FACED UNLESS SO ORDERED, FOR WHICH AN ADDITIONAL CHARGE OF FIVE CENTS, NET, PER HOLE WILL BE MADE.

FOR DRILLING TEMPLATES, SEE PAGE 652



## EXTRA HEAVY HYDRAULIC VALVES AND FITTINGS

We manufacture two lines of Hydraulic Flanged Valves and Fittings as follows:

Hydraulic Ferrosteel— $1\frac{1}{2}$  to 12 inch, inclusive—For Cold Water or Oil Working Pressures from 800 to 1200 pounds per square inch Hydrostatic, depending on sizes.

Hydraulic Cast Steel— $1\frac{1}{2}$  to 6 inch inclusive—For Cold Water or Oil Working Pressures up to 3000 pounds per square inch Hydrostatic.

We manufacture Malleable Iron, Cast Steel and Forged Steel Hydraulic Screwed Fittings covering a range of working pressures up to 6000 pounds per square inch Hydrostatic.

We manufacture Brass, Forged Steel and Cast Steel Screwed Valves covering a range of working up to 6000 pounds per square inch Hydrostatic.

In addition to the ordinary types of valves and fittings, we manufacture various specialties which are used to a considerable extent in Hydraulic Pipe Lines, such as Water Relief Valves, Sediment Separators and Shock Absorbers.

We are adding to our line as demand warrants and furnish material not shown in this catalogue if ordered in sufficient quantities. We have endeavored to build material to cover the requirements of ordinary hydraulic work. Material for HIGH TEMPERATURES or UNUSUAL CONDITIONS should be taken up as a SPECIAL PROPOSITION and we will endeavor to take care of any requirements.

### HYDROSTATIC AND SHOCK WORKING PRESSURES

All valves and fittings in this catalogue are suitable for the working pressures specified when used in hydraulic installations in which shock is absent or negligible and where the temperature does not exceed 125 degrees Fahrenheit.

It is well known that in certain classes of hydraulic installations where quick operating valves are used, such as hydraulic forging plants, steel mill operating systems, etc., the piping is subjected to more or less SHOCK because of the sudden operation of valves. Service of this character is sometimes very severe on the valves and fittings, and though the use of properly designed Shock Absorbers at various points will reduce the over-pressure, it is usually necessary to use heavier valves and fittings than would be required for an installation where shock is absent.

Ordinarily, hydraulic valves and fittings subject to shock should not be used for working pressures higher than 65 per cent of the "Hydrostatic" working pressure ratings published, and where shock is severe 50 per cent or even 40 per cent will be more conservative. Installations of this character should always be protected by Shock Absorbers, placed to the best advantage.

### AIR AND GAS

Our Hydraulic Valves and Fittings may be used on High Pressure Air or Natural Gas service up to the Hydrostatic Working Pressure published, providing the temperature does not exceed 125 degrees Fahrenheit.

However, material for this service should always be ordered special, because WHEN SO ORDERED, it is given a high pressure air-under-water test in addition to the usual hydraulic test. An additional charge is made for this test.

We can not be responsible for valves or fittings used on air or gas, unless THE ORDER SPECIFIES THAT THEY ARE FOR SUCH SERVICE.

Valves and Fittings for High Pressure Air or Gas where the temperature exceeds 125 degrees Fahrenheit are entirely special. Orders or inquiries for prices should give complete information regarding service conditions.

Ordinary Hydraulic Check Valves will not give satisfactory service on High Pressure Air or Gas. Valves for this service will be furnished with special construction. Prices on application.



## EXTRA HEAVY HYDRAULIC FERROSTEEL GATE VALVES

HARD METAL SEATS

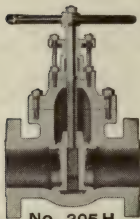
WEDGE GATE

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 POUNDS PER SQUARE INCH HYDROSTATIC

3 AND 4 INCH, 1000 POUNDS PER SQUARE INCH HYDROSTATIC

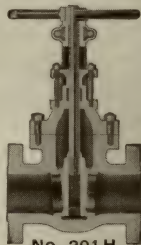
5 TO 12 INCH, 800 POUNDS PER SQUARE INCH HYDROSTATIC



No. 205 H

NON-RISING STEM

TESTED TO 2000 POUNDS  
HYDRAULIC PRESSURE  
PER SQUARE INCH



No. 201 H

OUTSIDE SCREW AND YOKE

### CONSTRUCTION

The bodies, bonnets and yokes of these Valves are made of Ferrosteel. The stem in the Non-Rising Stem Valve is made of Brass; in the Valve with Outside Screw and Yoke it is made of Steel and plated.

Brass stems for the Outside Screw and Yoke Valves will be furnished at an extra price.

The body is very heavy and has extra heavy hard metal seats which are screwed against shoulders in the body, thereby insuring perfect joints.

This construction of seat and method of screwing it in the body is very much better than any other, as there is no necessity of an auxiliary gland to keep the seats in an exact line and no trouble with leaks between the seat and the body which are liable to occur in other styles. These seats can be removed at any time should it be found necessary to renew them.

The gate is made very rigid and faced with hard metal. The guides in the gate are very carefully finished so as to slide smoothly on ribs in the body, thus preventing any rattling when Valve is partly open or any uneven wear of the faces.

The stuffing box gland flange on all these Valves is made of Malleable Iron with a brass follower, which gives the requisite additional strength and durability at this point.

Hard Metal is a superior metal and will withstand the wear that the seats of these Valves are subjected to.

The Outside Screw and Yoke, with its Rising Stem, is a perfect Indicator showing whether Valve is open or closed.

Valves with Inside Screw have Non-Rising Stem and are especially suitable for use on pump columns in mines, etc.

**THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE.**

To do so, with Non-Rising Stem Valves, open the Valve wide by running the wedge tightly up to the top of the bonnet, which in turn draws the collar of the stem down tightly against the flange of the bonnet, forming a steam or water tight joint.

For the Outside Screw and Yoke Valves the stem is screwed out until the taper collar on the stem engages with the top of the bonnet and forms a tight joint.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. When SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

## EXTRA HEAVY HYDRAULIC GATE VALVES

OUTSIDE SCREW AND YOKE      WITH AND WITHOUT BY-PASS  
FERROSTEEL      WEDGE GATE      HARD METAL SEATS      OPEN TO THE LEFT

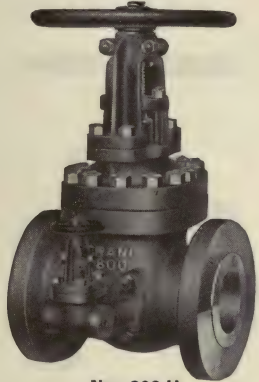
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 AND 4 INCH, 1000 LBS. HYDROSTATIC;  
5 TO 12 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE



No. 201 H



No. 203 H

Size.....Inches	1½	2	2½	3	4	5
No. 200 H, Screwed.....Each	20.00	27.00	40.00	54.00	75.00	100.00
No. 201 H, Flanged.....Each	22.00	30.00	45.00	59.00	80.00	108.00
Size.....Inches	6	7	8	10	12	
No. 200 H, Screwed.....Each	130.00					
No. 201 H, Flanged.....Each	140.00	195.00	210.00	330.00	430.00	
No. 203 H, Flanged with By-Pass..Each	160.00	220.00	235.00	360.00	460.00	

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

Larger sizes made to order. Prices on application.

It is desirable that all Valves 6 inch and larger have a By-Pass. We do not recommend the use of Screwed Valves larger than 6 inch.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

For general dimensions, see page 677.

Templates for drilling, page 653. Price List for drilling, page 157.

EXTRA HEAVY HYDRAULIC  
GATE VALVES

NON-RISING STEM

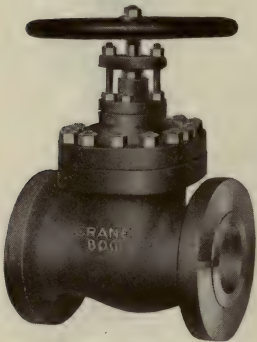
WITH AND WITHOUT BY-PASS

FERROSTEEL      WEDGE GATE      HARD METAL SEATS      OPEN TO THE LEFT

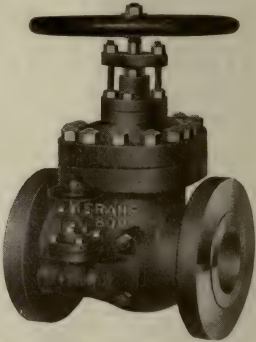
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 AND 4 INCH, 1000 LBS. HYDROSTATIC;  
5 TO 12 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



No. 205 H



No. 207 H

Size.....Inches	1½	2	2½	3	4	5
No. 204 H, Screwed.....Each	18.00	22.50	34.00	48.00	65.00	90.00
No. 205 H, Flanged.....Each	20.00	25.50	39.00	53.00	70.00	98.00
Size.....Inches	6	7	8	10	12	
No. 204 H, Screwed.....Each	115.00					
No. 205 H, Flanged.....Each	125.00	170.00	180.00	300.00	400.00	
No. 207 H, Flanged with By-Pass...Each	140.00	195.00	210.00	330.00	430.00	

WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

AIR OR GAS

Valves for Air or Gas are SPECIAL. See Explanatory notes on page 153.

Larger sizes made to order. Prices on application.

It is desirable that all Valves 6 inches and larger have a By-Pass. We do not recommend the use of Screwed Valves larger than 6 inch.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

For general dimensions, see page 677.

Templates for drilling, page 653. Price List for drilling, page 157.

# PRICE LIST FOR DRILLING

## EXTRA HEAVY HYDRAULIC

## FERROSTEEL FLANGED VALVES

### AND

### BOLTING COMPANION FLANGES TO VALVES AND FITTINGS

Size  Inches	Drilling Valves with Two Flanges  Each	BOLTING ON COMPANION FLANGES, NOT INCLUDING BOLTS OR GASKETS; FOR LABOR ONLY		
		Extra for Valve or Fitting with 2 Flanges Net	Extra for Fitting with 3 Flanges Net	Extra for Fitting with 4 Flanges Net
1½	.80	.30	.45	.60
2	1.00	.30	.45	.60
2½	1.10	.50	.75	1.00
3	1.20	.50	.75	1.00
3½		.50	.75	1.00
4	1.30	.50	.75	1.00
4½		.60	.90	1.20
5	2.25	.60	.90	1.20
6	3.00	.60	.90	1.20
7	5.00	.70	1.05	1.40
8	6.00	.70	1.05	1.40
10	8.00	.80	1.20	1.60
12	9.00	.80	1.20	1.60

BOLT HOLES WILL NOT BE SPOT FACED UNLESS SO ORDERED, FOR WHICH AN ADDITIONAL CHARGE OF FIVE CENTS, NET, PER HOLE WILL BE MADE.



# STANDARD IRON COCKS

FOR WORKING PRESSURES UP TO 125 POUNDS



SCREWED

## No. 320. ALL IRON COCKS

Size .....	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price .....	Each	.90	1.05	1.30	1.60	1.95	2.70	4.40
Price, Galvanized .....	Each	1.35	1.60	1.95	2.40	2.95	4.05	6.60
Size .....	Inches	3	3 1/2	4	5	6	8	
Price .....	Each	6.75	12.00	15.50	32.00	45.00	100.00	
Price, Galvanized .....	Each	10.15	18.00	23.25	48.00	67.50	150.00	

## No. 322. IRON COCKS WITH BRASS WASHER

Size .....	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price .....	Each	1.00	1.20	1.55	1.95	2.35	3.20	5.15
Size .....	Inches	3	3 1/2	4	5	6	8	
Price .....	Each	7.75	14.00	19.00	38.00	53.00	110.00	

## No. 324. IRON COCKS WITH BRASS PLUG

Size ..	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8
Price ..	Each	1.30	1.60	1.90	2.65	3.75	5.25	8.75	13.00	27.50	36.50	67.00	94.00	200.00

Flat Head, 1/2 inch to 2 inch, and Square Head, 2 1/2 inch to 8 inch, will always be furnished, unless otherwise ordered.

These Cocks will be furnished with Check when so ordered, at a special price.



## STANDARD IRON COCKS

FOR WORKING PRESSURES UP TO 125 POUNDS



### FLANGED

Size.....Inches	2	2½	3	3½
No. 325, All Iron.....Each	4.25	6.25	9.50	15.00
No. 327, with Brass Washer.....Each	4.75	7.00	10.50	17.00
No. 329, with Brass Plug.....Each	7.00	10.50	15.75	30.00
Diam. Flanges.....Inches	6	7	7½	8½
Size.....Inches	4	5	6	8
No. 325, All Iron.....Each	19.00	36.00	50.00	107.00
No. 327, with Brass Washer.....Each	22.50	42.00	58.00	117.00
No. 329, with Brass Plug.....Each	40.00	70.00	100.00	210.00
Diam. Flanges.....Inches	9	10	11	13½

Flat Head, 1 to 2 inch, and Square Head, 2½ to 8 inch, will always be furnished, unless otherwise ordered.

These Cocks will be furnished with Check when so ordered, at a special price.

Templates for drilling, page 650. Price List for drilling, page 141.

# STANDARD IRON THREE WAY COCKS

FOR WORKING PRESSURES UP TO 125 POUNDS



SCREWED

## No. 326. ALL IRON THREE WAY COCKS

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	1.65	1.80	2.05	2.65	3.65	5.35
Price, Galvanized.....Each	2.50	2.70	3.10	4.00	5.50	8.00
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	
Price.....Each	7.50	14.00	19.00	36.50	52.00	
Price, Galvanized.....Each	11.25	21.00	28.50	54.75	78.00	

## No. 328. IRON THREE WAY COCKS WITH BRASS WASHER

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	1.80	2.05	2.40	3.05	4.15	6.10
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	
Price.....Each	8.50	16.00	22.50	42.50	60.00	

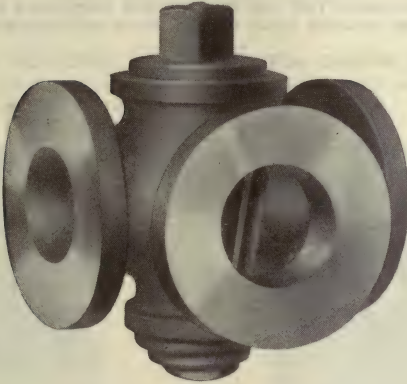
## No. 330. IRON THREE WAY COCKS WITH BRASS PLUG

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	2.20	2.40	3.10	4.50	6.25	9.75
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	
Price.....Each	13.75	30.00	40.00	71.50	100.00	

These Cocks will be furnished with Check when so ordered, at a special price.

# STANDARD IRON THREE WAY COCKS

FOR WORKING PRESSURES UP TO 125 POUNDS



FLANGED

## NO. 331. ALL IRON THREE WAY COCKS

Size.....Inches	2	2½	3	4	5	6
Price.....Each	7.00	9.00	12.75	26.00	44.00	60.00

## NO. 333. IRON THREE WAY COCKS WITH BRASS WASHER

Size.....Inches	2	2½	3	4	5	6
Price.....Each	7.50	9.75	13.75	29.50	50.00	68.00

## NO. 335. IRON THREE WAY COCKS WITH BRASS PLUG

Size.....Inches	2	2½	3	4	5	6
Price.....Each	9.50	13.25	19.00	47.00	80.00	108.00

These Cocks will be furnished with Check when so ordered, at a special price.

Templates for drilling, page 650. Price List for drilling, page 141.

## CRANE MINE COCKS FOR COMPRESSED AIR LINES

IRON BODY

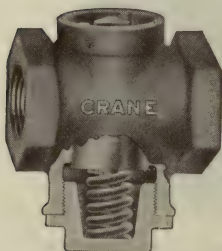
BRASS PLUG

STEEL SPRING

TESTED UNDER AIR PRESSURE

SUITABLE FOR 125 POUNDS AIR PRESSURE AND  
175 POUNDS COLD WATER WORKING PRESSURE

THE SPRING AUTOMATICALLY TAKES UP WEAR



**No. 318, LOCK-SHIELD  
TRIANGULAR HEAD**



**No. 319, EXPOSED  
SQUARE HEAD**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	3	4
No. 318.....Each	2.25	2.40	2.40	2.65	4.00	6.65	13.00	40.00
No. 319.....Each	2.25	2.40	2.40	2.65	4.00	6.65	13.00	40.00
Triangular Key Wrench...Each	.20	.20	.20	.25	.40	.65	1.00	5.00
Square Key Wrench.....Each	.20	.20	.20	.25	.40	.65	1.00	5.00

**NO. 318 PREVENTS TAMPERING—CAN ONLY BE OPERATED WITH TRIANGULAR  
WRENCH**

These Cocks are recommended for use on gasoline lines.

**OTHER SIZES MADE TO ORDER AT A SPECIAL PRICE**

## STANDARD IRON COCKS

Standard Cocks are made from well proportioned heavy patterns and are suitable for working pressures up to 125 pounds. They are made either All Iron, Iron with Brass Washer or Iron with Brass Plug.

The All Iron Cock should never be used for Water, as the Plug will stick in the barrel and it is almost impossible to turn it. We recommend Cocks with Brass Plug for Water.

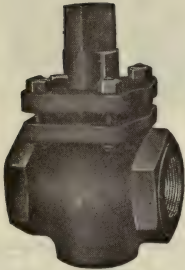
Cocks will be furnished Galvanized at a special price, when so ordered.

ALL STANDARD COCKS ARE TESTED TO 150 POUNDS HYDRAULIC PRESSURE

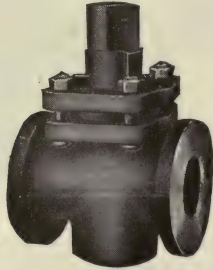
## ASBESTOS PACKED COCKS

### SOLID OR CHANNEL PACKED

TESTED AT 500 POUNDS PRESSURE AND SUITABLE FOR WORKING  
PRESSURES UP TO 150 POUNDS



No. 310 SCREWED



No. 311 FLANGED

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 310, Screwed...Each	1.30	1.30	1.45	1.60	2.10	2.50	3.50	4.75
No. 311, Flanged...Each				1.60	2.10	2.50	3.50	4.75
Diameter of Flanges.....Inches					$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	
No. 310, Screwed...Each	7.00	12.00	18.00	27.00	30.00	45.00	60.00	
No. 311, Flanged...Each	7.00	12.00	18.00	27.00	30.00	45.00	60.00	
Diameter of Flanges.....Inches	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11	

Heavy and Extra Heavy, also Angle and Three-way Cocks, also  
Ammonia Cocks with recessed and gland ends; prices on application.



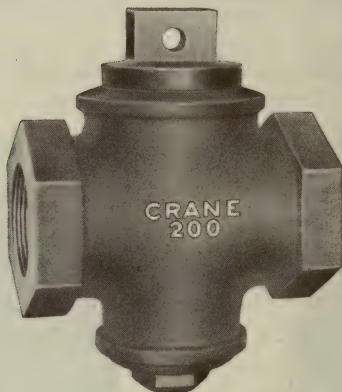
## SPECIAL IRON COCKS

EXTRA HEAVY

FLAT HEAD

WITH CAST IRON PLUG, NUT AND WASHER

FOR WORKING PRESSURES UP TO 200 POUNDS



### SCREWED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
No. 334, All Iron.....Each	1.15	1.25	1.75	2.10	2.80	3.65	6.50	9.00	22.50
No. 336, with Brass Washer...Each	1.25	1.40	2.00	2.45	3.20	4.15	7.25	10.00	26.00
No. 337, with Brass Plug.....Each	1.70	2.25	2.80	3.85	5.60	7.00	13.25	19.00	56.00

These Cocks are made extra heavy, with very liberal bearings.

### WRENCHES

FOR FLAT HEAD STANDARD AND SPECIAL IRON COCKS

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Number.....	20	21	22	23	24	25	26	27
Price.....Each	.20	.20	.35	.45	.60	.75	.90	1.25

### WRENCHES

FOR SQUARE HEAD STANDARD IRON COCKS

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Number.....	30	31	32	33	34	35
Price.....Each	.20	.20	.35	.45	.60	.75
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Number.....	36	37	38	39	40	41
Price.....Each	.90	1.25	1.50	1.65	1.90	2.10

SPECIAL IRON COCKS

EXTRA HEAVY

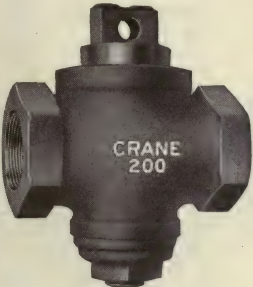
FLAT HEAD

WITH MALLEABLE IRON PLUG, NUT AND WASHER

FOR WORKING PRESSURES UP TO 200 POUNDS



No. 332



No. 338

No. 332

Size.....Inches	1	1¼	1½	2	2½	3	4
No. 332.....Each	2.50	3.00	4.00	5.00	10.00	13.00	31.00

These Cocks are made extra heavy, with very liberal bearings.

Owing to complaints made, from Flat Head Iron Cocks having the heads twisted off by opening, we designed the Malleable Iron Plug, which is very much superior in strength, and can not be broken by opening or closing the Cock. The nut and washer are other good features, on account of being much stronger than cast iron, and will not break when tapped with hammer in loosening the plug.

No. 338

OIL COUNTRY PATTERN

EXTRA HEAVY

FLAT HEAD

BRASS WASHER

FOR WORKING PRESSURES UP TO 200 POUNDS

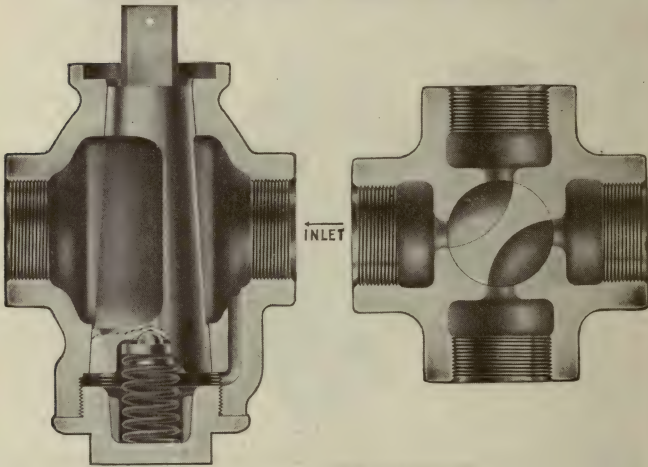
Size.....Inches	1	2
No. 338 .....Each	2.00	4.50
Weight each.....Pounds	4¼	17½

Furnished with Brass Plug at a special price.

Square Head Oil Country Cocks furnished when so specified.

EXTRA HEAVY  
FOUR WAY COCKS

IRON BODY, BRASS PLUG AND CAP                      NICKEL PLATED STEEL SPRING  
FOR COLD WATER WORKING PRESSURES UP TO 350 POUNDS  
THE SPRING AUTOMATICALLY TAKES UP WEAR



No. 339 SCREWED

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2
Price, Screwed.....Each	8.00	11.50	15.00	23.00	30.00	42.00

Cocks for air are specially ground at an extra price.  
The spring, which is located between the ground plug and the cap, automatically takes up wear, insuring a tight joint between the plug and body, and at the same time allows a free and easy movement of the plug.  
These Cocks are especially adapted for use in operating Hydraulic Presses, Hydraulically Operated Gate Valves, etc.  
The efficiency and durability of these Cocks, especially under hard and trying service conditions, will be appreciated by all users.  
When these Cocks are wanted for steam they will be furnished with iron plugs and are good for steam pressures up to 250 pounds.  
For air, a brass plug is furnished and the Cocks are suitable for pressures up to 250 pounds.

WRENCHES

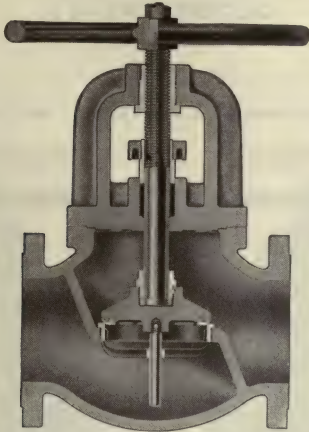


Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2
Price.....Each	.20	.20	.50	.65	.65	1.00

# EXTRA HEAVY—CAST STEEL GLOBE AND ANGLE VALVES

FLANGED

WITH YOKE



No. 21 STEEL

## GENERAL SPECIFICATIONS

- |         |   |   |
|---------|---|---|
| Class A | { | 350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE   |
|         |   | Cast Steel Body, Yoke and Swivel Disc.—Sizes 4 inch and larger, discs are faced with Monel Metal, 3½ inch and smaller, solid Monel Metal Discs. |
|         |   | Monel Metal Seat. Monel Metal Stem.   |
| Class B | { | 350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE   |
|         |   | Cast Steel Body, Yoke and Swivel Disc.—Sizes 4 inch and larger, discs are faced with Monel Metal, 3½ inch and smaller, solid Monel Metal Discs. |
|         |   | Monel Metal Seat. Rolled Steel Stem.  |
| Class C | { | 250 LBS. STEAM WORKING PRESSURE—550° F. TOTAL TEMPERATURE   |
|         |   | Cast Steel Body and Swivel Disc.—Sizes 4 inch and larger, discs are faced with Monel Metal, 3½ inch and smaller, solid Monel Metal Discs.       |
|         |   | Ferrosteel Yoke.  |
|         |   | Monel Metal Seat. Rolled Steel Stem.  |
| Class D | { | 400 LBS. WATER WORKING PRESSURE FOR BOILER FEED WATER THROTTLES   |
|         |   | Cast Steel Body, Yoke and Swivel Disc.—Sizes 4 inch and larger, discs are faced with Hard Metal, 3½ inch and smaller, solid Hard Metal Discs.   |
|         |   | Hard Metal Seat. Monel Metal Stem.  |

NOTE.—All Valves furnished with  $\frac{1}{16}$  inch raised face.

In ordering, always specify by NUMBER and LETTER denoting combination wanted.

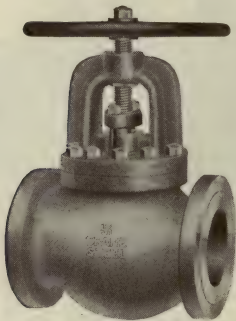
For Cast Steel Valves for High Pressure Water Lines, see pages 180 and 181.

EXTRA HEAVY—CAST STEEL  
GLOBE VALVES

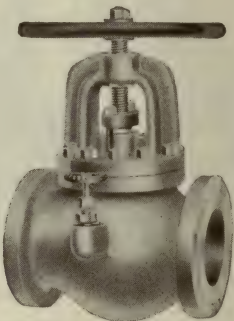
FLANGED

WITH YOKE

FOR STEAM WORKING PRESSURES, SEE PAGE 167



No. 21 STEEL



No. 27 STEEL

Size.....Inches	2	2½	3	3½	4	4½
No. 21 A, Flanged.....Each	57.50	70.00	85.00	100.00	115.00	130.00
No. 21 B, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
No. 21 C, Flanged.....Each	47.50	52.50	65.00	77.50	87.50	102.50
No. 21 D, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
Size.....Inches	5	6	7	8	10	
No. 21 A, Flanged.....Each	145.00	170.00	210.00	245.00	375.00	
No. 21 B, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 21 C, Flanged.....Each	110.00	127.50	160.00	185.00	290.00	
No. 21 D, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 27 A, Flanged, with By-Pass. Each		215.00	255.00	290.00	425.00	
No. 27 B, Flanged, with By-Pass. Each		190.00	225.00	255.00	375.00	
No. 27 C, Flanged, with By-Pass. Each		172.50	205.00	230.00	340.00	

All Valves 6 inches and larger should have a by-pass.  
For detailed specifications, see page 167.  
For general dimensions, see page 679.  
For drilling templates, see page 652. Price List for drilling, page 178.

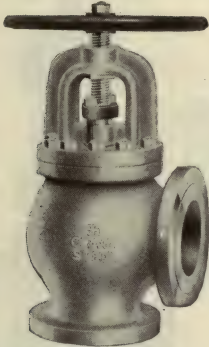


## EXTRA HEAVY—CAST STEEL ANGLE VALVES

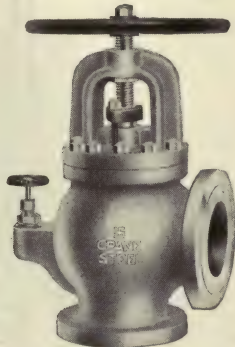
FLANGED

WITH YOKE

FOR STEAM WORKING PRESSURES, SEE PAGE 167



No. 23 STEEL



No. 29 STEEL

Size.....Inches	2	2½	3	3½	4	4½
No. 23 A, Flanged.....Each	57.50	70.00	85.00	100.00	115.00	130.00
No. 23 B, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
No. 23 C, Flanged.....Each	47.50	52.50	65.00	77.50	87.50	102.50
No. 23 D, Flanged.....Each	52.50	62.50	75.00	90.00	100.00	115.00
Size.....Inches	5	6	7	8	10	
No. 23 A, Flanged.....Each	145.00	170.00	210.00	245.00	375.00	
No. 23 B, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 23 C, Flanged.....Each	110.00	127.50	160.00	185.00	290.00	
No. 23 D, Flanged.....Each	125.00	145.00	180.00	210.00	325.00	
No. 29 A, Flanged, with By-Pass. Each		215.00	255.00	290.00	425.00	
No. 29 B, Flanged, with By-Pass. Each		190.00	225.00	255.00	375.00	
No. 29 C, Flanged, with By-Pass. Each		172.50	205.00	230.00	340.00	

All Valves 6 inches and larger should have a by-pass.

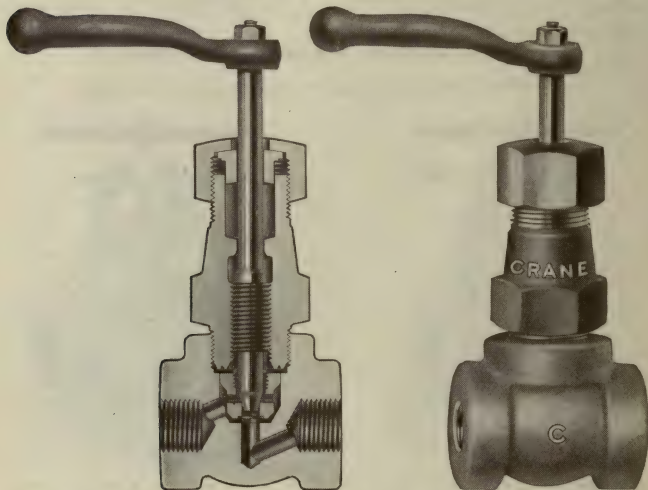
For detailed specifications, see page 167.

For general dimensions, see page 679.

For drilling templates, see page 652. Price List for drilling, page 178.

## DOUBLE EXTRA HEAVY HYDRAULIC FORGED STEEL GLOBE AND ANGLE VALVES

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS HYDROSTATIC



No. 225 H

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 225 H, Globe.....Each	21.00	23.00	27.00	33.00	45.00
No. 226 H, Angle.....Each	21.00	23.00	27.00	33.00	45.00

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are **NOT** recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

The diameter of the seat opening of these Valves is slightly smaller than the inside diameter of Double Extra Strong Pipe.

These Valves have been designed to meet the demand for a thoroughly reliable valve for use with hydraulic presses and extreme high pressure air or gas installations.

The body is machined from a solid steel forging.

Sizes  $\frac{3}{8}$  to 1 inch, inclusive, are made with screwed bonnet;  $1\frac{1}{4}$  inch size is made with bolted bonnet.

The seat is easily renewable.

Larger sizes made to order. Prices on application.

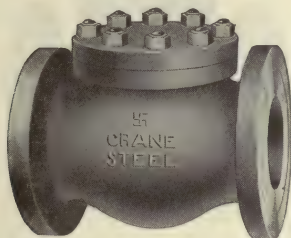
Valves for higher pressures made to order. Prices on application.

## EXTRA HEAVY CAST STEEL SWING CHECK VALVES

CAST STEEL BODY

HARD METAL SEATS

FOR BOILER FEED LINES UP TO 400 POUNDS WORKING PRESSURE



No. 39 D STEEL

MAY BE USED IN A HORIZONTAL LINE OR FOR UPWARD FLOW

Size.....Inches	2	2½	3	3½	4	4½
No. 39 D, Flanged.....Each	45.00	55.00	62.50	72.50	85.00	95.00
Face to Face.....Inches	10½	11½	12½	13¼	14	15
Diameter of Flanges.....Inches	6½	7½	8¼	9	10	10½

Size.....Inches	5	6	7	8	10	12
No. 39 D, Flanged.....Each	100.00	120.00	145.00	160.00	275.00	325.00
Face to Face.....Inches	15¾	17½	19¼	21	24½	28
Diameter of Flanges.....Inches	11	12½	14	15	17½	20

NOTE.—“Y” Pattern Stop Check Valves are meeting with considerable favor among many engineers for a hand-closed check valve in boiler feed lines and may be substituted for No. 39 D. This Valve has the important advantage of being easily reground.

The flanges of these Valves are regularly furnished with a raised face  $\frac{1}{16}$  inch high inside the bolt holes.

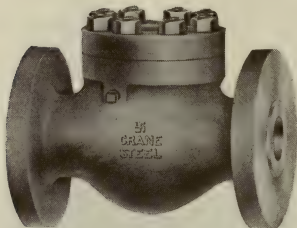
For drilling templates, see page 652. Price List for drilling, page 178.

## EXTRA HEAVY HYDRAULIC CAST STEEL SWING CHECK VALVES

FOR COLD WATER OR OIL WORKING PRESSURES UP  
TO 3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE

HARD METAL SEATS



No. 221 D STEEL

MAY BE USED IN A HORIZONTAL LINE OR FOR UPWARD FLOW

Size.....Inches	2½	3	4	5	6
Inside Diameter of Port.....Inches	2	2½	3	4	5
No. 220 D, Screwed.....Each	85.00	105.00	120.00	160.00	210.00
No. 221 D, Flanged.....Each	90.00	115.00	130.00	170.00	225.00
End to End, Screwed.....Inches	12	13	14	16	18
Face to Face, Flanged.....Inches	12½	14	16	18	20
Diameter Flanges.....Inches	8¾	10	11½	13½	15

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

The inside diameter of these Valves is approximately the same as that of Double Extra Strong Pipe.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

Templates for drilling, page 652. Price List for drilling, page 178..

# DOUBLE EXTRA HEAVY HYDRAULIC FORGED STEEL HORIZONTAL CHECK VALVES

**FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS HYDROSTATIC**

**TESTED TO 6000 POUNDS PER SQUARE INCH HYDRAULIC PRESSURE**



**No. 227 H**

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 227 H.....Each	21.00	23.00	27.00	33.00	45.00

## WORKING PRESSURES

These Valves are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures.** See explanatory notes on page 153.

## AIR OR GAS

Valves for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

The inside diameter of these Valves is slightly smaller than that of Double Extra Strong Pipe.

These Valves have been designed to meet the demand for a thoroughly reliable valve for use with hydraulic presses and extreme high pressure air or gas installations.

The body is machined from a solid steel forging.

Sizes  $\frac{3}{8}$  to 1 inch, inclusive, are made with screwed bonnet;  $1\frac{1}{4}$  inch size is made with a bolted bonnet.

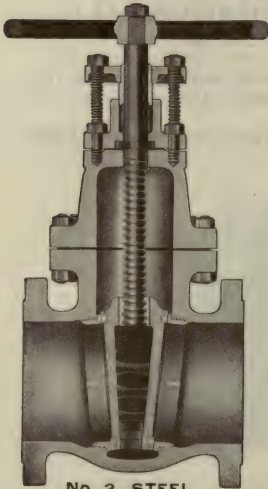
The seat and disc are easily renewable.

Large sizes made to order. Prices on application.

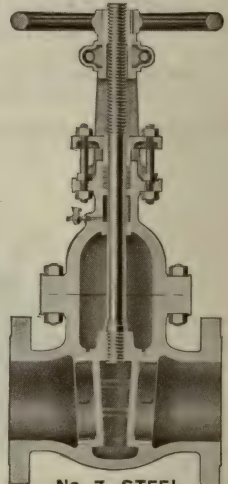
Valves for higher pressures made to order. Prices on application.



## EXTRA HEAVY CAST STEEL GATE VALVES



**No. 3 STEEL  
NON-RISING STEM**



**No. 7 STEEL  
OUTSIDE SCREW AND YOKE**

### GENERAL SPECIFICATIONS

- |             |   |   |
|-------------|---|---|
| Class<br>A  | { | <b>350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE</b><br>Cast Steel Body, Bonnet, Yoke and Disc.—Sizes 2½ inch and larger, discs are faced with Monel Metal, 2 inch and smaller, solid Monel Metal Discs.<br>Monel Metal Seats. Monel Metal Stem.                  |
| Class<br>B  | { | <b>350 LBS. STEAM WORKING PRESSURE—800° F. TOTAL TEMPERATURE</b><br>Cast Steel Body, Bonnet, Yoke and Disc.—Sizes 2½ inch and larger, discs are faced with Monel Metal, 2 inch and smaller, solid Monel Metal Discs.<br>Monel Metal Seats. Rolled Steel Stem.                 |
| *Class<br>C | { | <b>250 LBS. STEAM WORKING PRESSURE—650° F. TOTAL TEMPERATURE</b><br>Cast Steel Body and Disc.—Sizes 2½ inch and larger, discs are faced with Monel Metal, 2 inch and smaller, solid Monel Metal Discs.<br>Ferrostee Bonnet and Yoke.<br>Monel Metal Seats. Rolled Steel Stem. |
| Class<br>D  | { | <b>500 LBS. COLD WATER WORKING PRESSURE AND 400 LBS. BOILER FEED LINES</b><br>Cast Steel Body, Bonnet, Yoke and Disc.—Sizes 2½ inch and larger, discs are faced with Hard Metal, 2 inch and smaller, solid Hard Metal Discs.<br>Hard Metal Seats. Monel Metal Stem.           |

**NOTE.**—\*Classes A, B and D Valves only are furnished with condensing chamber and pet cock as shown.

All Valves furnished with  $\frac{1}{16}$  inch raised face.

In ordering, always specify by NUMBER and LETTER denoting the combination wanted.

For Cast Steel Valves for High Pressure Water Lines, see pages 180 and 181.

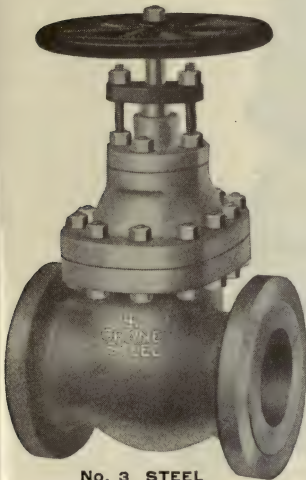
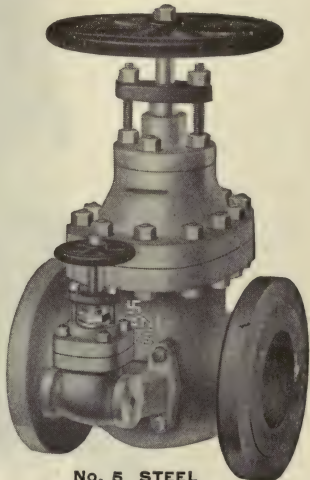
## EXTRA HEAVY CAST STEEL GATE VALVES

WEDGE GATE

NON-RISING STEM

OPEN TO THE LEFT

FOR WORKING PRESSURES, SEE PAGE 174

**No. 3 STEEL****No. 5 STEEL  
WITH BY-PASS  
(PATENTED)**

Size.....Inches	1¼	1½	2	2½	3	3½	4	4½
No. 3 D. Flanged.. Each	42.50	45.00	49.00	60.00	74.00	88.00	100.00	115.00
Size.....Inches	5	6	7	8	9	10	12	
No. 3 D. Flanged.. Each	125.00	145.00	175.00	205.00	255.00	315.00	380.00	
No. 5 D. Flgd. with By-Pass Ea.		190.00		250.00		365.00	445.00	

All Valves 6 inches or larger should have a by-pass.

For general specifications, see page 174. For general dimensions, see page 681.

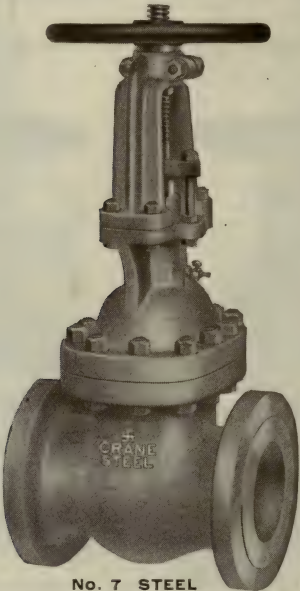
For drilling templates, see page 652. Price List for drilling, see page 178.

EXTRA HEAVY  
CAST STEEL GATE VALVES  
OUTSIDE SCREW AND YOKE

WEDGE GATE

OPEN TO THE LEFT

FOR WORKING PRESSURES, SEE PAGE 174



No. 7 STEEL

Size. . . . . Inches	1¼	1½	2	2½	3	3½	4	4½	5
No. 7 A, Flg'd. Each	50.00	52.50	57.50	70.00	85.00	100.00	115.00	130.00	145.00
No. 7 B, Flg'd. Each	45.00	47.50	50.00	62.50	75.00	90.00	105.00	120.00	135.00
No. 7 C, Flg'd. Each	40.00	42.50	45.00	56.50	69.00	78.00	90.00	105.00	120.00
No. 7 D, Flg'd. Each	45.00	47.50	51.50	62.50	77.00	92.00	105.00	120.00	130.00

Size. . . . . Inches	6	7	8	9	10	12	14	15	16
No. 7 A, Flg'd. Each	170.00	210.00	245.00	310.00	375.00	475.00	625.00	625.00	800.00
No. 7 B, Flg'd. Each	155.00	190.00	225.00	285.00	340.00	435.00	560.00	560.00	720.00
No. 7 C, Flg'd. Each	137.00	170.00	200.00	250.00	300.00	375.00	500.00	500.00	650.00
No. 7 D, Flg'd. Each	150.00	185.00	215.00	265.00	330.00	400.00	530.00	530.00	665.00

All Valves 6 inches and larger should have a by-pass.

For general specifications, see page 174. For general dimensions, see page 681.

For drilling templates, see page 652. Price List for drilling, see page 178.

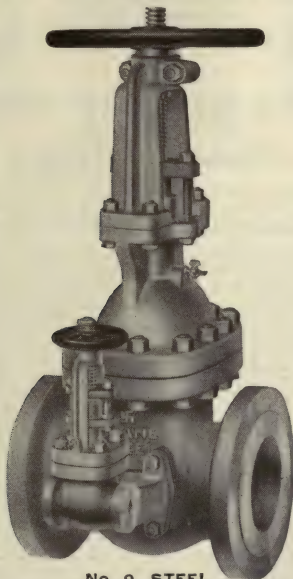
**EXTRA HEAVY  
CAST STEEL GATE VALVES  
OUTSIDE SCREW AND YOKE  
(PATENTED)**

WEDGE GATE

WITH BY-PASS

OPEN TO THE LEFT

FOR WORKING PRESSURES, SEE PAGE 174

**No. 9 STEEL**

Size.....Inches	6	7	8	9	10	12	14
No. 9 A, Flg'd...Each	225.00	265.00	300.00	365.00	440.00	560.00	710.00
No. 9 B, Flg'd...Each	205.00	240.00	275.00	335.00	400.00	515.00	640.00
No. 9 C, Flg'd...Each	180.00	215.00	245.00	300.00	350.00	440.00	565.00
No. 9 D, Flg'd...Each	200.00	235.00	265.00	320.00	385.00	470.00	600.00
Size.....Inches	15	16	18	20	22	24	
No. 9 A, Flg'd...Each	710.00	885.00	1200.00	1500.00	2000.00	2250.00	
No. 9 B, Flg'd...Each	640.00	800.00	1100.00	1350.00	1825.00	2050.00	
No. 9 C, Flg'd...Each	565.00	715.00	1000.00	1225.00	1675.00	1850.00	
No. 9 D, Flg'd...Each	600.00	735.00	1000.00	1250.00	1700.00	1900.00	

For general specifications, see page 174. For general dimensions, see page 681.

For drilling templates, see page 652. Price List for drilling, see page 178.

**PRICE LIST FOR DRILLING  
AND  
SPOT FACING**

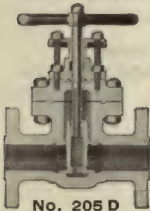
**EXTRA HEAVY—CAST STEEL  
FLANGED VALVES**

Size Inches	Globe or Gate Each Valve	Angle Each Valve
1¼	2.75	
1½	2.75	
2	3.00	3.50
2½	3.25	3.75
3	3.75	4.25
3½	4.00	4.50
4	4.50	5.00
4½	4.75	5.25
5	5.00	5.50
6	6.00	7.00
7	7.00	8.00
8	8.00	9.00
9	9.00	10.00
10	10.00	11.00
12	12.00	13.50
14	14.00	16.00
15	15.00	17.00
16	16.00	
18	20.00	
20	25.00	
22	30.00	
24	33.00	

FOR DRILLING TEMPLATES, SEE PAGE 652



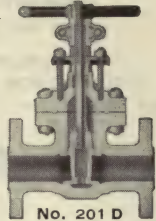
## EXTRA HEAVY HYDRAULIC CAST STEEL GATE VALVES



No. 205 D  
NON-RISING STEM

FOR COLD WATER OR OIL  
WORKING PRESSURES  
UP TO 3000 POUNDS  
HYDROSTATIC

TESTED TO 3000 POUNDS  
HYDRAULIC PRESSURE



No. 201 D  
OUTSIDE SCREW AND YOKE

### CONSTRUCTION

The bodies, bonnets, yokes and discs of these Valves are made of Crane Cast Steel. Sizes above 2 inch, the disc is faced with hard metal; size 2 inch, the disc is solid hard metal.

The stem in the Non-Rising Stem Valve is made of Brass; in the Valve with Outside Screw and Yoke it is made of Rolled Steel.

Brass Stems for the Outside Screw and Yoke Valves will be furnished at an extra price.

The body is very heavy and has extra heavy hard metal seats which are screwed against shoulders in the body, thereby insuring perfect joints.

This construction of seat and method of screwing it in body is very much better than any other, as there is no necessity of an auxiliary gland to keep the seats in exact line and no trouble with leaks between the seat and body which are liable to occur in other styles. These seats can be removed at any time should it be found necessary to renew them.

The gate is made very rigid and faced with hard metal. The guides in the gate are very carefully finished so as to slide smoothly on ribs in the body, thus preventing any rattling when Valve is partly open or any uneven wear of the faces.

Hard Metal is a superior metal and will withstand the wear that the seats of these Valves are subjected to.

The stuffing box gland flange on all these Valves is made of Malleable Iron with a brass follower, which gives the requisite additional strength and durability at this point.

The Outside Screw and Yoke with its Rising Stem, is a perfect Indicator showing whether Valve is open or closed.

Valves with Inside Screw have Non-Rising Stem and are especially suitable for use on pump columns in mines, etc.

### THESE VALVES MAY BE PACKED WHILE UNDER PRESSURE.

To do so, with Non-Rising Stem Valves, open the Valve wide by running the wedge tightly up to top of bonnet, which in turn draws the collar of the stem down tightly to the flange of bonnet, forming a steam or water-tight joint.

For the Outside Screw and Yoke Valves the stem is screwed out until the taper collar on the stem engages with the top of the bonnet and forms a tight joint.

Unless otherwise specified, Cast Steel Flanged Valves when ordered Faced and Drilled are always furnished with Spot Faced Bolt Holes, which is included in list price for drilling, page 132.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

The inside diameter of these Valves is approximately the same as that of Double Extra Strong Pipe.

### WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. When SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

**EXTRA HEAVY HYDRAULIC  
CAST STEEL GATE VALVES**

FOR COLD WATER OR OIL WORKING PRESSURES UP  
TO 3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE

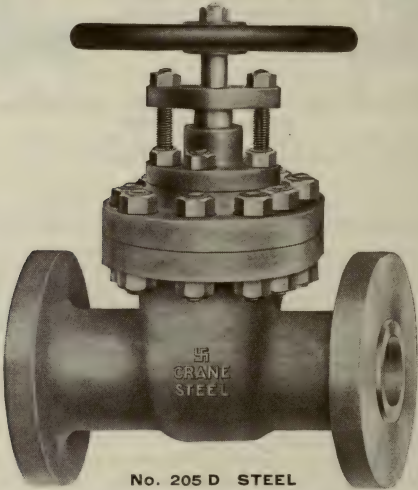
**INSIDE SCREW**

**NON-RISEING STEM**

**WEDGE GATE**

**HARD METAL SEATS**

**OPEN TO THE LEFT**



**No. 205 D STEEL**

Size.....Inches	2	2½	3	4	5	6
Inside Diam. of Port.....Inches	1½	2	2½	3	4	5
No. 204 D, Screwed.....Each	90.00	110.00	130.00	150.00	190.00	270.00
No. 205 D, Flanged.....Each	95.00	115.00	140.00	160.00	200.00	285.00

**WORKING PRESSURES**

These Valves are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

**AIR OR GAS**

Valves for Air or Gas are SPECIAL. See explanatory notes on page 153.

Larger sizes made to order. Prices on application.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

For general specifications, see page 179. For general dimensions, see page 682.

For drilling templates, see page 654. Price List for drilling, page 182.

# EXTRA HEAVY HYDRAULIC CAST STEEL GATE VALVES

FOR COLD WATER OR OIL WORKING PRESSURES UP  
TO 3000 POUNDS HYDROSTATIC

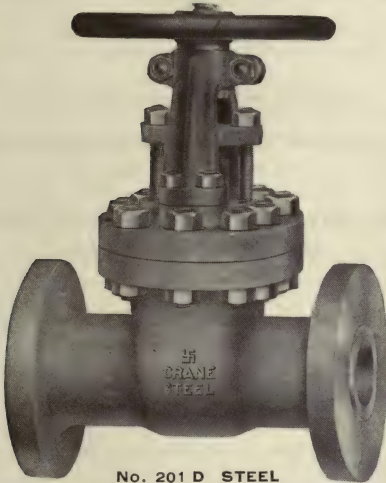
TESTED TO 3000 POUNDS HYDRAULIC PRESSURE

**OUTSIDE SCREW AND YOKE**

WEDGE GATE

HARD METAL SEATS

OPEN TO THE LEFT



**No. 201 D STEEL**

Size.....Inches	2	2½	3	4	5	6
Inside Diam. of Port.....Inches	1½	2	2½	3	4	5
No. 200 D, Screwed.....Each	95.00	115.00	135.00	160.00	200.00	285.00
No. 201 D, Flanged.....Each	100.00	120.00	145.00	170.00	210.00	300.00

## WORKING PRESSURES

These Valves are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are **NOT** recommended for these pressures. See explanatory notes on page 153,

## AIR OR GAS

Valves for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

Larger sizes made to order. Prices on application.

Unless otherwise specified, Flanged Valves will always be furnished with Male Face; in which case, Companion Flanges, when ordered with Valves, will be furnished with Female Face.

For general specifications, see page 179. For general dimensions, see page 682.

For drilling templates, see page 654. Price List for drilling, page 182.

**PRICE LIST FOR DRILLING  
AND SPOT FACING**

**EXTRA HEAVY HYDRAULIC  
CAST STEEL FLANGED VALVES**

**FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC**

Size	Price
Inches	Each
2	4.00
2½	5.00
3	5.00
4	6.00
5	9.00
6	10.00

## INDICATOR POSTS

These posts are made in two patterns; the STANDARD PATTERN suitable for all ordinary installations, and the UNDERWRITER PATTERN which is designed in accordance with the rules and requirements of the National Fire Protection Association and is marked CU to denote its use for fire protection service.

The object of these Indicator Posts is to provide means for operating underground Valves and furnish a positive indicator showing whether the Valves are open or closed. They are used principally in factory or mill yards in connection with the fire protection service, but may, with advantage, be used at any point where the Valve is underground.

The use of this post does away with the annoyance and delay of searching for a Valve box, which may be covered with snow or dirt.

The device consists of a strong cast-iron, tubular, adjustable post, made in two or more sections, as depth requires, which extends below the surface, where it is fastened to the Valve. The Valve stem is joined to the square operating rod by a suitable socket. Turning the nut to the left opens the Valve and exposes the word "Open" through the glass of the indicator; turning to the right closes the Valve and exposes the word "Shut."

Indicator Posts for Valves opening to the Right can be furnished on special order.

The operating nut is made  $1\frac{1}{4}$  inches square, unless otherwise ordered.

The post is not affected by the elements. The indicator openings are provided with removable metal frames, which carry heavy plate glass  $\frac{1}{2}$  inch thick. The letters are large and easily read.

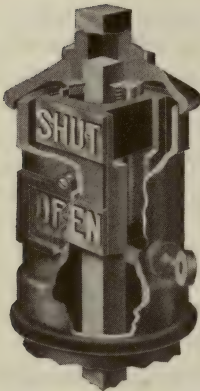
To prevent moisture gathering on indicator glass during cold weather, small openings are provided under cover which thoroughly ventilate the entire post.

The lower plate of the Indicator is adjustable, and its position on this Indicator is changed to suit the size of the Valve.

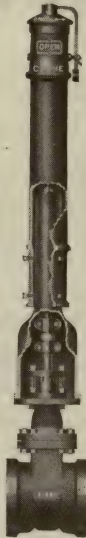


# **INDICATOR POSTS** **STANDARD PATTERN**

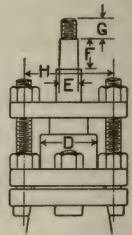
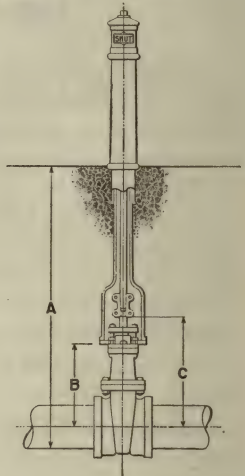
**SUITABLE FOR OPERATING VALVES FROM 2 TO 14 INCH**



**ENLARGED SECTIONAL  
VIEW OF HEAD  
DOUBLE FACE**



**No. 520  
AS APPLIED TO  
No. 462 GATE VALVE**



**INFORMATION  
FOR ORDERING**

Distance from Ground Level to Bottom of Pipe.....Feet	2 to 6
Indicator Post, including Wrench.....Each	40.00

Posts for Bury greater than 6 feet; prices on application.

When ordering, state size and catalogue number of Valve. Also give distance from ground level to bottom of pipe or trench, as shown by dimension A on illustration above.

When post is to be used with other than Crane Valves, state name of maker of Valve, size and style of end connections; also

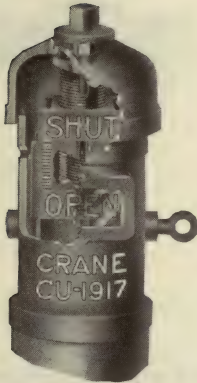
- 1—Whether Valves open by turning to right or left.
- 2—Number of turns required to fully open and close.
- A—Depth of trench.
- B—Center of pipe to top of stuffing box flange.
- C—Center of pipe to bottom of Valve stem square.
- D—Diameter of stuffing box.
- E—Size of square on Valve stem.
- F—Height of square on Valve stem.
- G—Length of threaded end on Valve stem.
- H—Diameter of stuffing box bolt circle.
- J—Diameter of stuffing box studs.
- K—Number of stuffing box studs.

Indicator Posts, when furnished for use with other than Crane Valves, will be made to order at a special price.

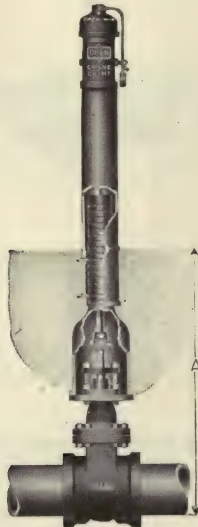
## INDICATOR POSTS

FOR FIRE PROTECTION SERVICE, UNDERWRITERS' PATTERN

SUITABLE FOR OPERATING VALVES FROM 2 TO 14 INCH



ENLARGED SECTIONAL  
VIEW OF HEAD  
DOUBLE FACE



No. 510  
AS APPLIED TO  
No. 462½ GATE VALVE

Distance from Ground Level to Bottom of Pipe . . . . .	Feet	2 to 6
Indicator Post, including Wrench . . . . .	Each	40.00

Posts for Bury greater than 6 feet; prices on application.

WHEN ORDERING, STATE SIZE AND CATALOGUE NUMBER OF VALVE. ALSO GIVE DISTANCE FROM GROUND LEVEL TO BOTTOM OF PIPE OR TRENCH, AS SHOWN BY DIMENSION A ON ILLUSTRATION ABOVE.

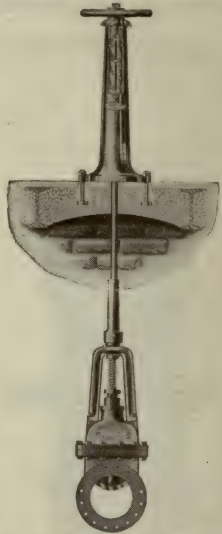
WHEN ORDERING POSTS FOR USE WITH OTHER THAN CRANE VALVES, GIVE INFORMATION REQUESTED ON PAGE 184.

These Posts are designed in accordance with the rules and requirements of the NATIONAL FIRE PROTECTION ASSOCIATION.

These Posts are marked "CU" to denote their use for fire protection service.

## FLOOR STANDS

WITH OR WITHOUT INDICATOR ATTACHMENTS  
SUITABLE FOR RISING OR NON-RISING STEM VALVES



FLOOR STAND WITHOUT INDICA-  
TOR ATTACHED TO  
NON-RISING STEM VALVE

FLOOR STAND WITH INDICATOR  
ATTACHED TO  
RISING STEM VALVE

### PRICE LIST

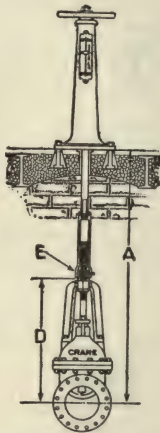
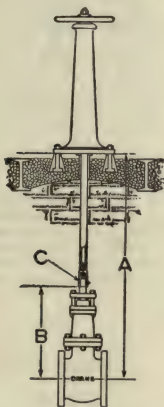
WITHOUT INDICATOR	20 Inches	32 Inches
	High	High
Painted column; japanned wheel; wheel stem coupling; no extension stem.....Each	15.00	20.00
Finished column; japanned wheel; wheel stem coupling; no extension stem.....Each	28.00	35.00
Finished column; rim and hub of wheel finished, spokes japanned; no extension stem.....Each	40.00	48.00
WITH INDICATOR	20 Inches	32 Inches
	High	High
Painted column; japanned wheel with indicator trimmings complete; no extension stem.....	22.00	27.00
Finished column; japanned wheel with indicator trimmings complete; no extension stem.....	35.00	42.00
Finished column; rim and hub of wheel finished, spokes japanned; indicator trimmings complete; no extension stem.....	47.00	55.00

Extension Stems extra. Price according to length, size and style of valve.

Directions for ordering Floor Stands, on opposite page.

## FLOOR STANDS

WITH OR WITHOUT INDICATOR ATTACHMENTS  
SUITABLE FOR RISING OR NON-RISING STEM VALVES



### DIRECTIONS FOR ORDERING FLOOR STANDS FOR ALL VALVES

- 1—Specify with or without indicator.
- 2—Give size and style of valve.
- 3—Give manufacturer's name and catalogue number of valve.
- 4—Give outside diameter of hand wheel on valve.
- 5—Give number of turns right or left to open valve.

#### IF WANTED WITH EXTENSION STEMS

The following additional information is required.

A—Center of valve to floor level.

#### NON-RISING STEM VALVES.

- B—Center of valve to bottom of square on valve stem.  
C—Size and length of square part of valve stem.

#### RISING STEM VALVES.

- D—Center of valve to bottom of sleeve.  
E—Give in detail construction of sleeve where wheel fits.

**NOTE.**—Unless otherwise specified, the 32 inch stand will be furnished for Valves having a hand wheel 9 inches and larger in diameter and the 20 inch stand for Valves having a hand wheel less than 9 inches in diameter.

Extension Stems are made up of Extra Strong pipe with suitable couplings riveted to same, unless otherwise ordered.

In addition to regular Stands we can furnish special Stands for various conditions.

See page 189 for a number of various applications of Floor Stands.

Drawings and estimates furnished on Floor Stands for complex applications.

# ILLUSTRATING VARIOUS STYLES OF GEARING FOR OPERATING LARGE VALVES

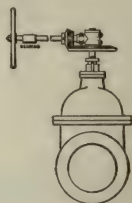
## NON-RISING STEM VALVES



**STYLE S**  
SPUR GEARING



**STYLE U**  
BEVEL GEARING



**STYLE V**  
BEVEL GEARING  
WITH EXTENDED SHAFT,  
BOX AND HAND WHEEL  
WHICH CAN BE SET AT  
ANY HORIZONTAL ANGLE

## RISING STEM VALVES



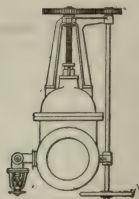
**STYLE N**  
PINION SHAFT PERPENDICULAR  
TO RUN OF VALVE



**STYLE O**  
PINION SHAFT PARALLEL  
TO RUN OF VALVE



**STYLE P**  
SPUR GEARING  
WITH HAND WHEEL ABOVE

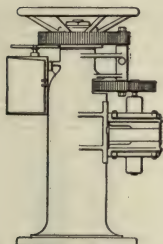


**STYLE Y**  
SPECIAL SPUR GEARING  
WITH EXTENDED OPERATING  
SHAFTS FOR OPERATING  
DIRECTLY BELOW

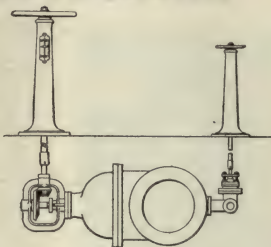
PRICES ON APPLICATION



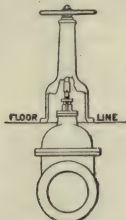
# ILLUSTRATING VARIOUS APPLICATIONS OF CRANE FLOOR STANDS WITH OR WITHOUT INDICATOR ATTACHMENTS

**APPLICATION D**

FLOOR STAND WITH ELECTRIC  
MOTOR

**APPLICATION E**

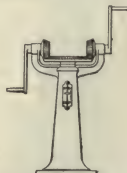
FLOOR STANDS ATTACHED TO HORI-  
ZONTAL VALVE WITH BY-PASS

**APPLICATION L**

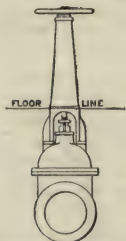
FOR NON-RISING STEM  
VALVES. BELL PATTERN  
FLOOR STAND FOR CLOSE  
QUARTERS

**APPLICATION F**

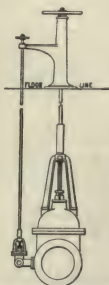
FLOOR STAND WITH  
SINGLE BEVEL GEARING  
AND HAND WHEEL

**APPLICATION G**

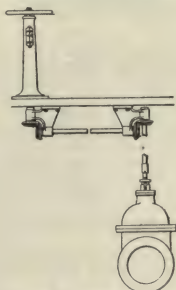
FLOOR STAND WITH  
DOUBLE BEVEL GEARING  
AND CRANK HANDLES

**APPLICATION J**

FLOOR STAND FOR  
RISING STEM VALVE,  
BOLTED TO VALVE BONNET  
FOR CLOSE QUARTERS

**APPLICATION K**

FLOOR STAND WITH ARM  
FOR OPERATING BY-PASS

**APPLICATION H**

FLOOR STAND, ATTACHED  
TO VERTICAL VALVE BY  
MITRE GEARING

## PRICES ON APPLICATION

ALL INQUIRIES SHOULD STATE WHETHER PLAIN OR INDICATOR FLOOR  
STANDS ARE WANTED.

CHAIN WHEELS AND GUIDES  
FOR CRANE VALVES

PRICES OF CHAIN WHEELS AND GUIDES\*



Pitch Diameter of Chain Wheel Inches	Non-Rising Stem Gate Valves Each	Rising Stem Gate Valves Each	Guides for Chain Wheels Each
3	1.50	3.50	
4	1.50	3.50	
5	1.75	3.75	
7½	2.25	4.50	9.00
10	2.50	5.00	9.00
14	5.50	8.00	9.50
18	9.00	12.00	10.00
24	12.00	16.00	13.00
30	21.00	26.00	15.00

\*Prices of Chain Wheels are extra over price of complete Valve. No allowance for regular wheel.

The prices for Guides include putting them on the Valves.

Chain Wheels for Globe and Angle Valves are same price as for Non-Rising Stem Gate Valves.

Price of Chain for Chain Wheels.....per foot .20

Price for connecting Ends of Chain.....per chain .30

In ordering Chain for Chain Wheels be sure to specify the diameter of the Wheel with which the Chain is to be used.

TABLE GIVING SIZES OF CHAIN WHEELS USED ON CRANE VALVES

BRASS VALVES					Pitch Diameter Chain Wheel	ALL VALVES EXCEPT BRASS						
GATES, GLOBES AND ANGLES						GATES				GLOBES AND ANGLES		
Light	Stand- ard	Me- dium	Extra Heavy	Hy- draulic		Light	Stand- ard Medium	Extra Heavy	Hy- draulic	Stand- ard	Me- dium	Extra Heavy
2-2½	1½-2	1¼-1½	1-1¼	¾-1	3							
3-3½	2½-3	2-2½	1½-2	1¼-1½	4		1¼-1½					
4	3½	3	2½	2	5		2-2½ 3-3½	2-2½	1½	2-2½ 3-3½	2-2½	2
	4	3½-4	3	2½-3	7½		4 4½-5	3-3½	2	4 4½-5	3 3½-4	2½ 3-3½
					10		6-7 8-9	4 4½-5	2½ 3-3½	6-7	4½-5 6-7	4
					14	12 14-15 16-18	10-12	6-7	4 4½-5	8-10	8-9	5-6
					18	20-22 24-26	14 15-16	8 9-10	6-7	12	10 12-14	7
					24	28 30-32 34-36	18-20 22-24	12-14 15-16 18-20	8-9 10-12	14 15-16 18-20		8 10-12
					30	40-42	30	22-24				14-15

## EXTRA HEAVY GATE VALVES

WITH HYDRAULIC LIFT AND HAND RELEASING DEVICE

FERROSTEEL

BRASS LINED CYLINDER

HARD METAL SEATS

WEDGE GATE



FOR STEAM WORKING PRES-  
SURES UP TO 250 POUNDS

No. 13 E  
WITH No. 339 FOUR-WAY  
COCK



As the name indicates, these Valves are actuated by water pressure, either from suitably high pressure city water supply or from boiler feed or service pumps, by simply opening the four-way cock, which may be located in any convenient place within reasonable distance from the Valve.

The Valve Stem extending above the hand wheel indicates whether the Valve is open, partly open or closed.

The hand wheel at top of Valve has a very short travel and is used only for the purpose of releasing the wedge from its seats, after it has been closed tightly by the piston. This wheel is not suitable for totally closing or opening the Valve.

We make these Valves to order, either screwed or flanged ends.

By-Pass Valves also furnished, when so specified.

When made of cast steel with Monel Metal trimmings these Valves are good for superheated steam up to 350 pounds working pressure and a total temperature of 800 degrees Fahrenheit.

INQUIRIES FOR PRICES SHOULD SPECIFY whether Valves are to be furnished with either screwed or flanged ends, and in what position the Valves are to be installed; also working pressure of fluid in valve; also minimum and maximum actuating water pressure to which the cylinder will be subjected.

We recommend that the water pressure for actuating the cylinder be as high as available, thus allowing the use of as small diameter cylinder as possible, on large size Valves.

## MOTOR OPERATED GATE VALVES

### GENERAL DESCRIPTION

These Valves are manufactured in sizes 4 to 72 inch, inclusive, for all conditions of pressure and service. Any of the various lines of Crane iron body and steel gate valves can be supplied with motor.

Sizes 24 inch and smaller are furnished with outside screw and yoke unless otherwise ordered.

Sizes larger than 24 inch are furnished with inside screw non-rising stem unless otherwise ordered. Non-rising stem valves are made with indicator to show the position of the gate.

The motor is mounted on a stand which is bolted to the valve bonnet and operates the valve through a train of enclosed gears. All parts of the motor drive are on the outside. The valve has no more inside parts than a hand operated valve. A hand wheel is provided by means of which the valve can be operated by hand when electric power is not in service.

The motors for Crane Motor Operated Gate Valves are manufactured especially for valve service and can be installed directly on full voltage without the use of resistance or compensating starter. They are sufficiently powerful to operate the valve under the most extreme conditions and can be furnished for direct current or poly-phase alternating current of standard voltages.

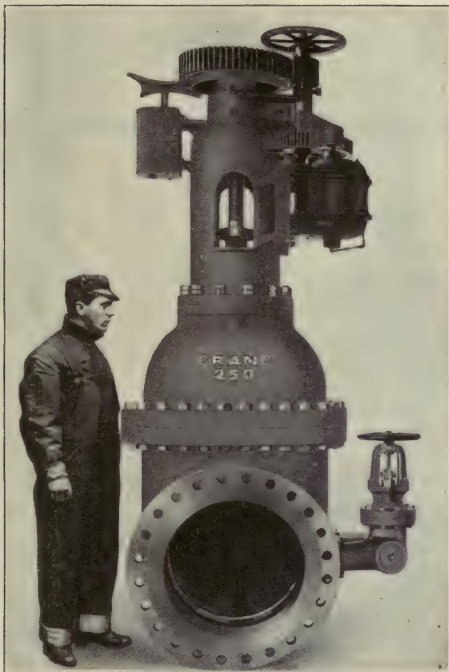
All Crane Motor Operated Gate Valves are provided with a limit switch which automatically stops the motor when the valve is tightly seated or wide open. This switch is capable of fine adjustment and is so constructed that the adjustment cannot change in operation.

Two types of control can be furnished; Short Distance and Remote. The short distance control consists of a panel with a line switch, operating switch and fuses. In opening or closing the valve the operator manipulates only one switch. The motor may be stopped at any point of the valve travel, by merely opening the operating switch.

The remote control is used when the valve is installed at a considerable distance from the control station. This type of control has two panels, one for the control station and the other to be located as near the valve as convenient. The operation of the valve is controlled by manipulation of the single switch on the operator's panel just as it is with short distance control. Indicator lamps on the operator's panel show whether the valve is open, closed, or partly open.

## MOTOR OPERATED GATE VALVES

(PATENTED)



Any of the various lines of Crane Iron Body and Steel Gate Valves can be supplied with motor.

Orders or inquiries for prices should specify the following:

1. Working pressure.
2. Description of service.
3. If direct current, give voltage.
4. If alternating current, give voltage, cycles and phases.
5. Specify type of control, whether short distance or remote.
6. If short distance, state whether indicating lamps are desired. Remote control is regularly furnished with indicating lamps.
7. If remote control, state whether Valve is to be operated from one or from more than one station.

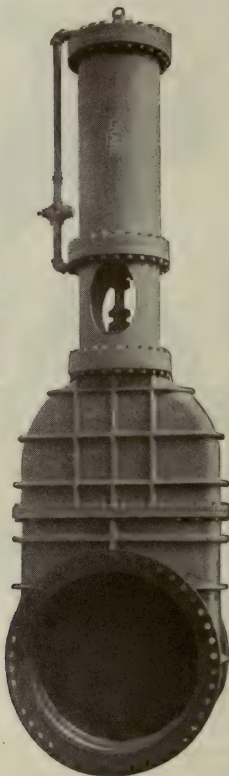


## GATE VALVES

### WITH HYDRAULIC LIFT CYLINDERS

### FOR ALL PRESSURES AND PURPOSES

As the name indicates, these Valves are actuated by water pressure, either from the city water supply, or from boiler feed or service pumps, by simply opening the four-way cock, which may be located in any convenient place within reasonable distance from the Valve.



Unless otherwise specified, these Valves will be furnished with the piston rod extending through the top cylinder head, for the purpose of indicating whether the Valve is open, partly open or closed.

We make these Valves to order, either screwed, flanged or hub ends.

By-Pass Valves also furnished, when so specified.

**INQUIRIES FOR PRICES SHOULD SPECIFY** whether Valves are to be furnished screwed, flanged or hub ends, and in what position the Valves are to be installed, with stem horizontal, vertical or at an angle; also, the maximum pressure to which the Valve will be subjected; also, the minimum and maximum actuating pressure to which the cylinder will be subjected.

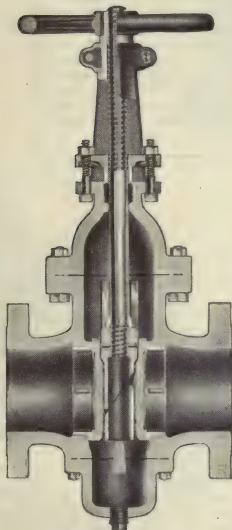
We recommend that the water pressure for actuating the cylinder be as high as available, thus allowing the use of as small diameter cylinder as possible, on large size Valves.

# **GATE VALVES WITH CLEAN-OUT POCKET**

## **FOR CREOSOTE**

### **FOR ALL PRESSURES**

#### **FERROSTEEL BODY**

**WEDGE GATE****PARALLEL SEATS AND DOUBLE DISC**

### **THE CLEAN-OUT POCKET**

which is removable, retains sediment, foreign matter, etc.

To clean the Valve it is unnecessary to remove it from the line or take Valve apart; simply remove Clean-Out Pocket. Then free access to interior of Valve is allowed.

The following Valves can be furnished with Clean-Out Pocket for use with Creosote in Wood Preserving Plants.

Medium Wedge Gate Valves, pages 143 to 145.

Extra Heavy Wedge Gate Valves, pages 148 to 150.

Standard Double Disc Gate Valves, page 140.

Extra Heavy Double Disc Gate Valves, page 151.

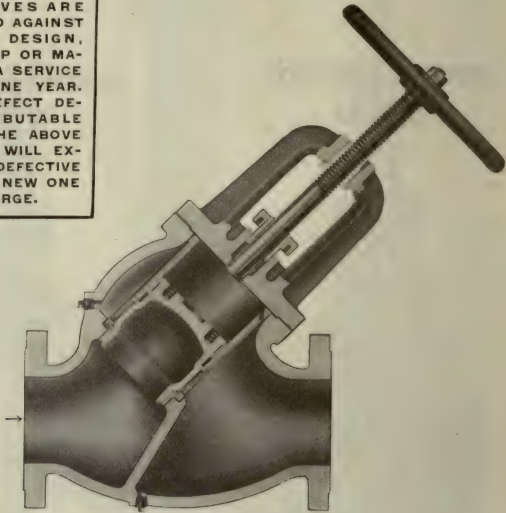
**PRICES ON APPLICATION**

**WHEN ORDERING SPECIFY FOR CREOSOTE WITH CLEAN-OUT POCKET**

**CRANE Y PATTERN**  
**AUTOMATIC STOP-CHECK VALVES**  
**EXTRA HEAVY**

**GUARANTEE**

IF PROPERLY INSTALLED THESE VALVES ARE GUARANTEED AGAINST DEFECTS IN DESIGN, WORKMANSHIP OR MATERIAL, FOR A SERVICE PERIOD OF ONE YEAR. SHOULD A DEFECT DEVELOP ATTRIBUTABLE TO ANY OF THE ABOVE CAUSES, WE WILL EXCHANGE THE DEFECTIVE VALVE FOR A NEW ONE WITHOUT CHARGE.



PAT. APPLIED FOR

All steam plants having more than one boiler should have one of these combination Stop-Check Valves in the piping, between each boiler and the main steam line or header.

In the event of a tube blowing out, or the bursting of a joint in the boiler lead to which a Stop-Check Valve is connected, the valve will instantly and automatically close, cutting out the boiler, and acting as a non-return valve, prevent a back flow of steam from the main.

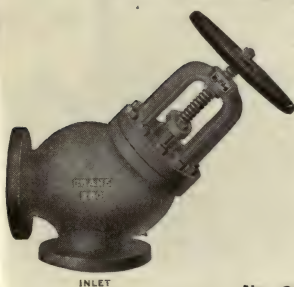
They also act as a Safety Stop-Valve, preventing any steam entering or backing into a closed boiler while men are at work inside.

Each Valve will open promptly and automatically when the boiler to which it is connected reaches the full pressure in the main, but will remain closed against a higher pressure in the main; consequently, a sluggish boiler may be readily detected, and the firing given proper attention.

They should be placed so that the boiler pressure comes underneath the disc.

**AUTOMATIC STOP-CHECK VALVES****EXTRA HEAVY****FERROSTEEL BODY AND YOKE****STEEL STEM****SEATS AND DISCS OF HARD METAL****RENEWABLE SEAT****FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

**No. 28E STRAIGHT Y**  
**USED IN HORIZONTAL OR VERTICAL LINES**



**No. 30E ANGLE Y**  
**PAT. APPLIED FOR**  
**USED IN EITHER POSITION**

Size ..... Inches	2½	3	4	5	6	7	8	10
No. 28E, Straight Flanged. Ea.	45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00
No. 30E, Angle Flanged. Each	45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00

Screwed Valves 2½ to 6 inch will be furnished at the same price.

When ordering Stop-Check Valves it is good policy to give the horse power and working pressure of the boiler on which the Valve is to be used.

These Stop-Check Valves conform to the requirements of paragraph 303, page 76, of the A. S. M. E. Boiler Code.

For general dimensions, see page 683.

For drilling templates, see page 652. Price List for drilling, page 152.

# **CRANE-ERWOOD AUTOMATIC DOUBLE ACTING NON-RETURN AND EMERGENCY CUT-OUT VALVES**

**EXTRA HEAVY**

**(PATENTED)**

## **PRINCIPAL DUTIES OF THE CRANE-ERWOOD VALVE**

### **No. 1. BOILER PROTECTION**

In the event of a tube blowing out or the bursting of a joint in the boiler to which a Crane-Erwood Valve is connected, the Valve will instantly and automatically close, cutting out the boiler, and, acting as a non-return valve, prevent the back-flow of steam from the main.

### **No. 2. CUTTING IN**

Each Valve will open promptly and automatically when the boiler to which it is connected reaches the full pressure in the main, but will remain closed against a higher pressure in the main; consequently a sluggish boiler may be readily detected and the firing given proper attention.

### **No. 3. HEADER PROTECTION**

The valve when properly adjusted will close automatically in case any large part of the header or distributing lines gives out, such as the bursting of a fitting, valve or pipe.

### **No. 4. OPENING LARGE VALVES**

The Crane-Erwood Valve will close automatically in case the operator opens a large valve too rapidly.

### **No. 5. AUTOMATIC CUT IN**

When the Valve has automatically closed, due to a break or sudden reduction in pressure beyond the outlet of valve, it will automatically open when the pressure in the header or main steam pipe again equals that of the boiler. This is done through the medium of the by-pass which should be open at all times, except when it becomes necessary to cut out the header from the boiler on account of breaks or shut-downs.

### **No. 6. REMOTE CONTROL**

As an Emergency Valve, a cable may be attached to the lever so that the Valve can be closed by hand at a distance. The Valve may also be closed from any part of the building by an electrical attachment.

### **No. 7. LINE PROTECTION**

These Valves may be used as line protect on valves, for protecting long lines of steam piping such as branch lines from power house to various points, either overhead or trench work and long lines for heating systems, etc.

### **No. 8. HEADER PROTECTION**

When a boiler "primes" heavily, the Valve will close, and prevent slugs of water entering the header.

## **GENERAL INFORMATION**

The levers on the outside of the Valve are in line with the discs, and give a positive indication of their position and the operation of the Valve at all times.

The separating link, connecting the outside levers, may be adjusted to suit the load to be carried. Shortening the link decreases the volume of steam passing through the Valve; lengthening the link increases the volume and does not interfere with the automatic operation of the Valve. The Valve may be adjusted to close at any desired velocity. The adjustments are made from the outside while the Valve is in operation.



**CRANE-ERWOOD  
AUTOMATIC DOUBLE ACTING  
NON-RETURN AND EMERGENCY  
CUT-OUT VALVES**

(PATENTED)

**EXTRA HEAVY**

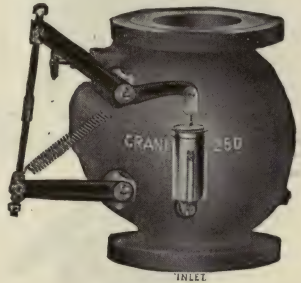
FERROSTEEL BODY

HARD METAL SEATS AND DISCS

**FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**No. 36 E. HORIZONTAL**



**No. 37 E. VERTICAL**

**PRICE LIST FLANGED VALVES**

Size.....Inches	4	5	6	7	8	10
No. 36 E, Horizontal.....Each	120.00	150.00	180.00	210.00	240.00	400.00
No. 37 E, Vertical.....Each	120.00	150.00	180.00	210.00	240.00	400.00

Vertical type Valves are the same general design and dimensions as the horizontal, but differ as to the location and position of the outside operating parts. When ordering Vertical, be particular to specify Vertical No. 37 E, otherwise Horizontal No. 36 E will always be furnished.

For general dimensions, see page 684.

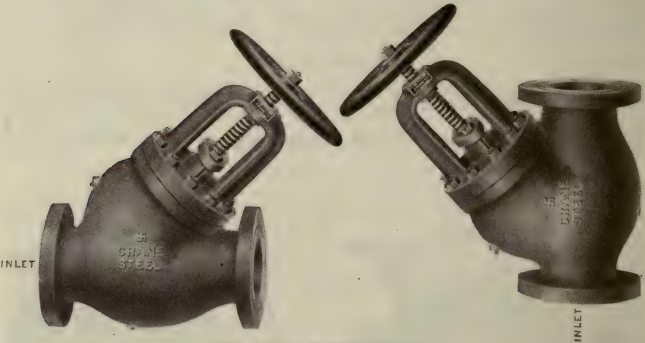
For drilling templates, see page 652. Price List for drilling, page 152.

EXTRA HEAVY CAST STEEL  
AUTOMATIC STOP-CHECK VALVES

CAST STEEL BODY AND YOKE  
MONEL METAL SEAT SEAT

MONEL METAL DISC  
MONEL METAL STEM

FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE  
AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT



No. 28A STRAIGHT Y  
USED IN HORIZONTAL OR VERTICAL LINES



No. 30A ANGLE Y  
PAT. APPLIED FOR  
USED IN EITHER POSITION

Size.....Inches	2½	3	4	5	6	7	8	10
No. 28A Straight Flanged. Ea.	97.50	120.00	160.00	195.00	245.00	295.00	375.00	575.00
No. 30A Angle Flanged. Each	97.50	120.00	160.00	195.00	245.00	295.00	375.00	575.00

For general dimensions, see page 683.  
For drilling templates, see page 652. Price List for drilling, page 178.

**EXTRA HEAVY CAST STEEL**  
**CRANE-ERWOOD**  
**AUTOMATIC DOUBLE ACTING**  
**NON-RETURN AND EMERGENCY**  
**CUT-OUT VALVES**

(PATENTED)

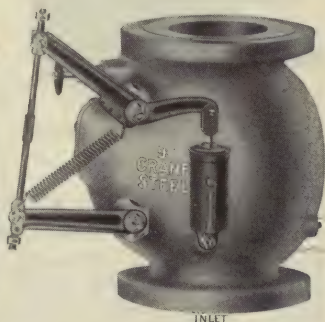
CAST STEEL BODY

MONEL METAL SEATS AND DISCS

FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE  
 AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT



No. 36 A HORIZONTAL



No. 37 A VERTICAL

**PRICE LIST FLANGED VALVES**

Size.....Inches	4	5	6	7	8	10
No. 36 A, Horizontal.....Each	275.00	315.00	360.00	420.00	480.00	800.00
No. 37 A, Vertical.....Each	275.00	315.00	360.00	420.00	480.00	800.00

Vertical Type Valves are the same general design and dimensions as the horizontal, but differ as to the location and position of the outside operating parts. When ordering Vertical, be particular to specify Vertical No. 37 A, otherwise Horizontal No. 36 A will always be furnished.

For general dimensions, see page 684.

For drilling templates, see page 652. Price List for drilling, page 178.

STANDARD  
BACK PRESSURE VALVES

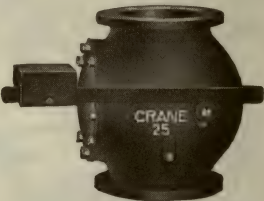
IRON BODY

BRASS TRIMMINGS

WEIGHTED FOR BACK PRESSURE UP TO FIVE POUNDS



HORIZONTAL



VERTICAL

No. 384 SCREWED

Size .....	Inches	2	2½	3	3½	4	5
Price .....	Each	11.00	13.00	15.00	19.00	22.50	33.50
Size .....	Inches	6	7	8	10	12	
Price .....	Each	43.00	70.00	85.00	120.00	180.00	

No. 385 FLANGED

Size .....	Inches	6	7	* 8	10	12
Price.....	Each	47.00	75.00	90.00	130.00	200.00
Face to Face.....	Inches	14	16	17	20	24
Diameter of Flanges.....	Inches	11	12½	13½	16	19

THE CONSTRUCTION OF THESE VALVES IS SUCH THAT THE HORIZONTAL PATTERN CAN ONLY BE FURNISHED IN SIZES 4 INCH AND LARGER.

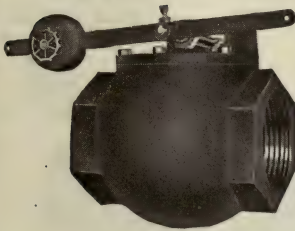
TEMPLATES FOR DRILLING, PAGE 650.    PRICE LIST FOR DRILLING, PAGE 141  
COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES, PAGES 204, 205

# **NOISELESS BACK PRESSURE VALVES**

**FOR NON-CONDENSING ENGINES ONLY**

**DOUBLE DISC**

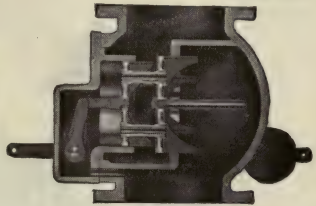
**IRON BODY**



**HORIZONTAL**

**PISTON TYPE**

**BRASS TRIMMINGS**



**VERTICAL**

**CAN BE PLACED IN EITHER HORIZONTAL OR VERTICAL POSITION BY  
CHANGING THE POSITION OF LEVER AND WEIGHT**

## **No. 416. SCREWED**

Size. Ins.	2	2½	3	3½	4	4½	5	6	7	8	9
Price. Ea.	14.00	16.00	18.00	22.00	25.00	30.00	40.00	60.00	80.00	100.00	120.00
End to End Inches	6⅝	7⅞	9	9¾	10⅝	11¼	12⅞	13⅞	14½	16⅞	17¾

## **No. 417. FLANGED**

Size.....Inches	2	2½	3	3½	4	4½	5
Price.....Each	14.00	16.00	18.00	22.00	25.00	30.00	40.00
Diam. of Flanges. Inches	6	7	7½	8½	9	9¼	10
Face to Face....Inches	7⅝ <sup>1</sup>	9	9⅝	10⅝	11¼	12¾	13⅞
Size.....Inches	6	7	8	9	10	12	14
Price.....Each	60.00	80.00	100.00	120.00	145.00	220.00	345.00
Diam. of Flanges. Inches	11	12½	13½	15	16	19	21
Face to Face....Inches	14⅞	15½	16½	18⅞	20⅞	24¼	26⅞
Size.....Inches	15	16	18	20	22	24	
Price.....Each	400.00	465.00	600.00	750.00	900.00	1050.00	
Diam. of Flanges. Inches	22¼	23½	25	27½	29½	32	
Face to Face....Inches	26⅞	28⅞	31¼	33¼	44¾	44¾	

These Valves have a single disc equal to the full area of the pipe and are provided with a balancing disc to eliminate excessive weighting. Standard Valves are intended for a working pressure range limit as follows:

Sizes 2 to 6 inch, 1 to 10 pounds; 6 to 10 inch, 1 to 6 pounds; 10 to 20 inch, 1 to 4 pounds; 20 to 24 inch, 1 to 3 pounds, with a preference for horizontal installation. When these Valves are desired for other ranges, the positions and pressures must be specified. Valves will be furnished, based on the above working range, up to 15 pounds without extra charge. These Valves are not absolutely tight.

Templates for drilling, page 650. Price List for drilling, page 141.

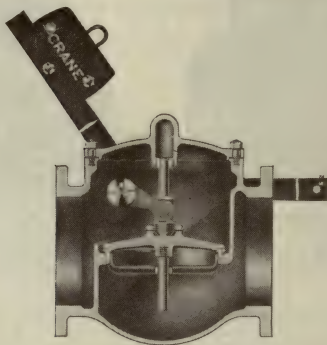


# COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES

FOR CONDENSING OR NON-CONDENSING ENGINES

IRON BODY

BRASS MOUNTED



No. 415 H HORIZONTAL

## GENERAL

These Valves are provided with outside dashpot to cushion the discs and prevent pounding or hammering and are so constructed that foreign matter can not collect and interfere with their operation.

The lever weights are arranged so that the Valves may be used as **ATMOSPHERIC EXHAUST RELIEF VALVES** for condensing engines or as **BACK PRESSURE VALVES** for non-condensing engines.

Sizes 16 inch and larger have double levers and weights.

## EXHAUST RELIEF VALVES FOR CONDENSING ENGINES

When used as **ATMOSPHERIC EXHAUST RELIEF VALVES** for condensing engines, they remain closed while the vacuum is maintained in the condenser, but should the vacuum be lost, the Valves will open automatically by reason of the pressure of the exhaust steam lifting the disc, permitting the engine to exhaust freely into the atmosphere and **STAY OPEN UNTIL CLOSED BY HAND** when the weight is located on the angle arm of the outside levers, as shown in cut above.

Means are provided for water sealing the Valve seat.

## BACK PRESSURE VALVES FOR NON-CONDENSING ENGINES

When arranged as **BACK PRESSURE VALVES** for use with non-condensing engines, the weight is bolted to the horizontal arm of the lever. They may be weighted for a maximum Back Pressure of five pounds.

These Valves are also recommended for use on Vacuum Heating Systems.

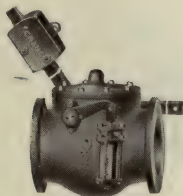
# COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES

## STAY OPEN TYPE

### FOR CONDENSING OR NON-CONDENSING ENGINES

#### PATENTED

IRON BODY

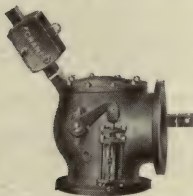


No. 415 H HORIZONTAL

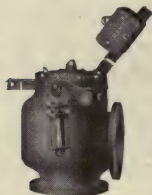
BRASS MOUNTED



No. 415 V VERTICAL



No. 415 A ANGLE



SPECIAL DOWN DISCHARGE

PRICE LIST OF

## HORIZONTAL, VERTICAL AND ANGLE VALVES

No. 414 SCREWED

Size.....Inches	4	4½	5	6	7	8	9	10	12
Price.....Each	64.00	72.00	88.00	120.00	175.00	195.00	260.00	310.00	385.00

No. 415 FLANGED

Size.....Inches	4	4½	5	6	7	8	9	10	12
Price.....Each	64.00	72.00	88.00	120.00	175.00	195.00	260.00	310.00	385.00
Size.....Inches	14	15	16	18	20	22	24	30	36
Price.....Each	475.00	525.00	575.00	675.00	775.00	1050.00	1350.00	2100.00	3000.00

THE 15 INCH IS MADE ONLY IN THE HORIZONTAL AND VERTICAL PATTERNS

Sizes 7 inch and smaller have internal Dash Pots.

Sizes 8 inch and larger have external Dash Pots.

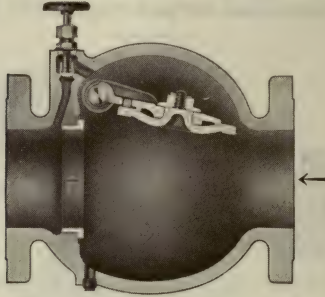
The above prices do not apply to the Special Down Discharge Valves, which are made to order only in sizes 12 inch and larger, at a special price.

Sizes 16 inch and larger have double levers.

For general dimensions, see page 685.

For drilling templates, see page 650. Price List for drilling, page 141.

## EXTRA HEAVY EMERGENCY ENGINE STOP VALVE



The frequency of accidents which require shutting down the engine instantly has led several States to require by law a quick-closing Engine Stop Valve on the steam lead to each engine.

We have developed a Valve for this purpose which meets all the exacting requirements.

This Valve may be closed instantly in case of accident. It may be operated from one or several points outside the danger zone. It is simple in construction, has few parts, and is not likely to get out of order.

The metals and proportions are such as to safely withstand the shock of suddenly stopping the flow of steam.

It may be tested as often as required to show that it is in working condition.

The design is that of a Swing Check Valve with the flow against the back of the disc.

The disc is attached to a shaft which extends through a stuffing box to the outside of the Valve. A lever is attached to the shaft, one end of which engages with the releasing device (hand or electrical), and a weight is attached to the other end of the lever to assist in closing the Valve.

A by-pass is provided to equalize the steam pressure on both sides of the disc, when the Valve is to be opened.

A drain is provided to take care of condensation.

The Valve may be installed in a vertical or horizontal position, or at any angle, by adjusting the lever so the disc will open and close properly.

While the engine is running, the disc is held out of the path of the steam by the releasing device, operated either by a cord or electrical push-button. To stop the engine, the cord is pulled or the button pushed and the weight on the lever brings the disc into the path of the steam and it is closed instantly.

To reset the Valve, the throttle valve must be closed. The by-pass on the Engine Stop Valve is then opened, and when the pressure is equalized on both sides of the disc, the lever may be raised and the Valve reset. The by-pass valve should then be closed.

# EXTRA HEAVY EMERGENCY ENGINE STOP VALVE NEW PATTERN

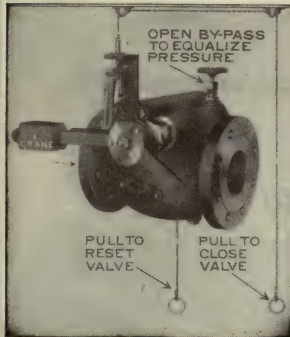
(PATENT APPLIED FOR)

FERROSTEEL BODY AND COVER

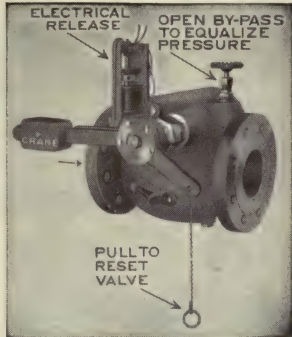
HARD METAL SEAT AND DISC

MANGANESE BRONZE HINGE AND STEM

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**No. 46 E  
HAND RELEASE**



**No. 46½ E  
ELECTRICAL RELEASE  
FOR REMOTE CONTROL**

Size.....Inches	3	4	5	6	7	8	10
No. 46 E, Hand Release. Each	90.00	100.00	120.00	145.00	175.00	210.00	260.00
No. 46½ E, Electrical Release. Each	135.00	145.00	165.00	190.00	220.00	255.00	305.00
Face to Face.....Inches	13½	14	15¾	17½	19¼	21	24½
Diameter of Flanges..Inches	8¼	10	11	12½	14	15	17½

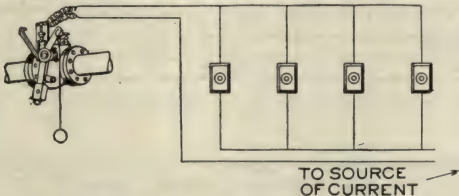
The prices given above include the releasing device mounted on Valve. No chain, pulleys, wires or push buttons are furnished.

In ordering specify whether Valve is for use in horizontal or vertical pipe and whether for upward or downward flow.

These Valves are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

When made of Cast Steel with Monel Metal seats and discs these Valves are good for superheated steam up to 350 pounds working pressure and a total temperature of 800 degrees Fahrenheit.

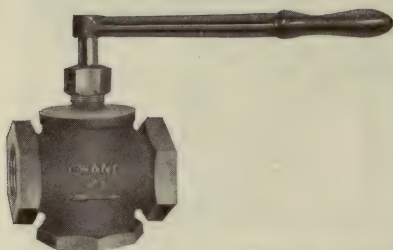
For drilling templates, see page 652. Price List for drilling, page 152.



**WIRING DIAGRAM FOR ELECTRICAL RELEASE**  
PUSH BUTTONS OR SWITCHES MAY BE LOCATED ANYWHERE

## THROTTLE VALVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**No. 46  
BRASS**



**No. 382  
IRON BODY  
BRASS MOUNTED**

### No. 46

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	10.00	11.50	14.00	20.00	25.00	35.00

In ordering, always specify Brass Throttle Valves.

### No. 382

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Screwed.....Each	30.00	40.00	50.00	60.00
End to End.....Inches	$7\frac{1}{8}$	8	$8\frac{3}{4}$	$9\frac{3}{4}$

Full opening in one-quarter turn.

These Valves will also be furnished with body and bonnet of Cast Steel for steam working pressures up to 250 pounds.

Prices on application.



# WATER PRESSURE REGULATORS

## FOR SERVICE PIPES

### ROUGH BODY



Size .....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Rough .....Each	8.00	8.50	13.50	16.45	28.60	39.20

Valves 1 inch and smaller are regularly furnished with Iron Body and Hard Bronze Inside Parts. Valves  $1\frac{1}{4}$  inch and larger have Brass Bodies.

Special small relief valves made to interchange with the Regulator Cap on sizes  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 inch are furnished when required at an additional price. For larger size Regulators, we recommend using a  $\frac{3}{4}$  inch Standard Water Relief Valve (listed elsewhere in this catalogue) which we will furnish when ordered, at an additional price.

These Relief Valves should be used to prevent excessive pressure on the delivery side as a result of a failure of the Regulator to close tightly. These Regulators should always be protected by an efficient strainer.

Regulators are not set unless so ordered.

They are readily adjusted to suit the desired pressure by turning the tension screw to the Right to increase or to the Left to reduce the pressure.

Orders must specify delivery pressure wanted. Regularly furnished for delivery pressures of from 20 to 50 pounds. Can be furnished for delivery pressures ranging from 5 to 75 pounds where so specified, at the same prices.

# STANDARD PRESSURE REDUCING VALVES

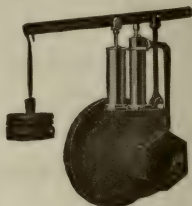
FOR STEAM, ALSO WATER OR AIR WHEN SO SPECIFIED



No. 971



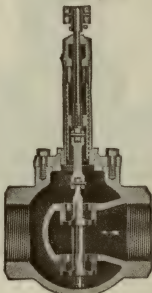
No. 972



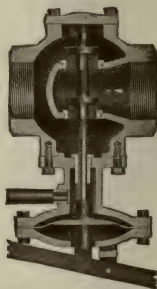
No. 973



No. 974  
MARINE TYPE



INTERIOR VIEW  
PISTON TYPE



No. 975  
LOW PRESSURE TYPE

**No. 971 REGULATORS** are for general service and used where the duty is steady on the reduced pressure side.

**No. 972 REGULATORS** are the same as No. 971 with the addition of Dash Pot, which prevents noise or chattering when duty on the reduced pressure side is varying, due to the quick opening and closing of Valves, or the pulsation of pressure, as in the steam pipe of Engines or Pumps, or the exhaust of high speed Engines.

**No. 973 REGULATORS** have Expanded Outlet, allowing steam to expand quickly and decrease in velocity. These Valves are especially adapted to conditions requiring large volumes of steam, reduced noiselessly from comparatively high to very low pressures for steam heating and other purposes. Expanded Outlet Valves of the 975 Low Pressure type for use on Low Pressure and Vacuum Heating Systems, are also furnished in corresponding sizes and numbered 975½. Prices on opposite page.

**Nos. 971, 972 AND 973 REGULATORS** are suitable for initial steam working pressures up to 200 pounds.

**No. 974 REGULATORS (MARINE TYPE)** are fitted with very heavy working parts to withstand high steam pressures up to 200 pounds. They have sliding ball weights with set screws, instead of loose weights, and are especially adapted for marine and all high pressure service.

**No. 975 LOW PRESSURE REGULATORS** are principally used for steam heating purposes and intended for low pressure service only. Their operation is very sensitive and positive and is governed entirely by the pressure existing in the low pressure main, which acts directly on the diaphragm, by means of the small size pipe connection. The lever is fitted with an adjustable regulating weight on each end. These Regulators are also furnished in the Expanded Outlet type, No. 975½, for extremely low pressure or vacuum systems. Sizes and Price List on opposite page.

# STANDARD PRESSURE REDUCING VALVES

## FOR STEAM, ALSO WATER OR AIR WHEN SO SPECIFIED

Size Inches	No. 971 Scr'd or Fl'g'd Each	Nos. 972 and 974 Scr'd or Fl'g'd Each	No. 975 Scr'd or Fl'g'd Each	Size Inches	No. 973 Ex- panded Outlet Each	No. 975½ Expanded Outlet Not Illus. Each	Diam. of Stand- ard Flang's Inches	Diam. of Extra Heavy Flang's Inches
½	18.00	22.00	26.00	1×2	35.00	40.00		
¾	20.00	24.00	26.00	1¼×2½	40.00	50.00		
1	22.00	26.00	28.00	1½×3	48.00	60.00		
1¼	24.00	28.00	32.00	2×3	54.00	70.00		
1½	25.00	30.00	35.00	2×4	60.00	80.00		
2	30.00	36.00	40.00	2½×5	80.00	90.00	6	6½
2½	35.00	42.00	50.00	3×5	90.00	110.00	7	7½
3	40.00	48.00	60.00	3×6	100.00	130.00	7½	8¼
3½	50.00	60.00	70.00	3½×7	110.00	145.00	8½	9
4	60.00	72.00	80.00	4×6	110.00	160.00	9	10
5	75.00	90.00	105.00	4×7	150.00	175.00	10	11
6	100.00	120.00	140.00	4×8	160.00	190.00	11	12½
7	135.00	160.00	180.00	5×8	170.00	210.00	12½	14
8	175.00	200.00	230.00	5×9	220.00	230.00	13½	15
10	275.00	300.00	290.00	5×10	235.00	250.00	16	17½
12	400.00	435.00	360.00	6×8	220.00	280.00	19	20
				6×10	250.00	300.00	21	22½
				6×12	335.00	320.00		
				8×12	400.00	350.00		
				8×14	430.00	400.00		
				8×16	475.00	450.00		
				10×16	650.00	600.00		
				10×20	700.00	650.00		

The 1½ inch and smaller Regulators are made of all brass; the 2 inch and larger have iron bodies and brass trimmings.

The 1½ inch and smaller Regulators have screwed ends only; 2 to 6 inch, made either with screwed or flanged ends; larger sizes made with flanged ends only.

When ordering, be particular to state size and style number, whether screwed or flanged; also give boiler pressure and pressure desired on reduced side; state what purpose Regulator is for, and whether same is to be used on steam, water or air.

Unless otherwise specified, screwed Regulators up to and including 6 inch will be sent, and in all cases when the style is not given, No. 971 will be furnished.

When flanged Regulators are ordered, we will always furnish with standard diameter flanges, and not drilled, unless otherwise specified. Extra heavy diameter flanges will be furnished when so specified, without extra charge. Drilling flanges will be at an extra price.

The No. 974 Regulator (Marine Type) will always be furnished with extra heavy diameter flanges in sizes 2 inch and larger, and smaller sizes with screwed ends, unless otherwise specified.

The No. 973 and No. 975½ Expanded Outlet Regulators, sizes 1×2 to 2×4, have screwed ends only; 2½×5 to 3×6 have inlet screwed and outlet flanged; 3½×7 to 10×20 have inlet and outlet flanged only.

The No. 975 Low Pressure Regulators, sizes 2 to 6 inch, are made either screwed or flanged; sizes 7 inch and larger, with flanged ends only.

Templates for drilling Valves with Standard diam. flanges, page 650.

Price List for drilling Valves with Standard diam. flanges, page 141.

Templates for drilling Valves with Ex. Heavy diam. flanges, page 652.

Price List for drilling Valves with Ex. Heavy diam. flanges, page 152.

## PRESSURE REGULATORS

### FOR STEAM AND AIR

The prevailing use of high pressures and the increase in the number of industrial processes using steam and air have greatly increased the need for automatic devices which will reduce and properly regulate steam and air pressures. Not all power apparatus is adapted for the high pressures so common today, nor is it economical to use a pressure higher than that required to do the work, and steam for heating systems is often taken from high pressure power boilers.

Wherever it is necessary or desirable to reduce the pressure of steam or air, a Crane Pressure Regulator should be used because they are designed particularly to give accurate automatic pressure regulation. Our regulators are recommended because they possess the following features: Reliability, wide range of variation in reduced pressure, simplicity of operation, accessibility for inspection, convenience in making repairs.

All Crane Pressure Regulators are made for any initial working pressure of air or saturated steam up to 250 pounds. They may also be used with superheated steam up to 200 pounds working pressure and a total temperature not to exceed 500 degrees Fahrenheit.

One pressure regulator will perform the entire reduction regardless of the difference between initial and reduced pressures provided a regulator of the proper capacity is used. See important note at bottom of page 213.

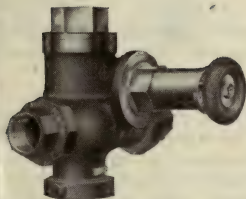
Crane Pressure Regulators are adapted for use with steam heating systems, vulcanizers, cookers, paper machines, engines, pumps, turbines, dryers, various industrial processes, air tools, blasts, heaters of various kinds, etc.



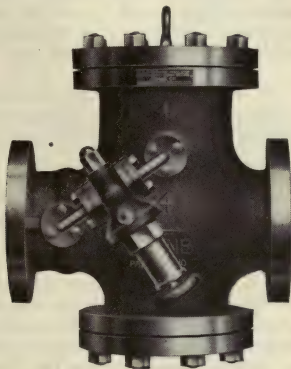
## PRESSURE REGULATORS

FOR SATURATED STEAM OR AIR WORKING PRESSURES  
UP TO 250 POUNDS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 200 POUNDS AND  
A TOTAL TEMPERATURE OF 500 DEGREES FAHRENHEIT



No. 962 UNION ENDS



No. 963 FLANGED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 962.....Each	43.00	48.00	54.00	67.00	83.00	104.00	
No. 963.....Each							130.00
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	8	
No. 962.....Each							
No. 963.....Each	155.00	200.00	225.00	310.00	420.00	800.00	

Navy Type of Spring Case equipped with padlock, supplied with any size, at \$7.00 extra list.

Regulators are regularly furnished with the pilot valve on the left hand side. Sizes  $\frac{1}{2}$  to 2 inch, inclusive, will be furnished right hand when so ordered. Sizes  $2\frac{1}{2}$  to 8 inch, inclusive, are reversible and may be changed "on the job" to either right or left hand.

Facing the inlet, the side the pilot valve is on determines whether the Regulator is right or left hand.

The No. 963 is regularly furnished with flanges faced and drilled, for which no extra charge is made. For drilling templates, see page 652. The port openings of the No. 963, sizes  $2\frac{1}{2}$  to 8 inch, inclusive, are tapped iron pipe size so that the Valves may be connected by screwed joints if desirable. The No. 962, sizes 1 to 2 inch, inclusive, have union connections.

For general dimensions, see page 686.

**IMPORTANT NOTE.**—A Regulator will not give satisfactory service unless it is of the proper size. This is not determined by the size of the pipe line in which it is to be placed but by the service it is to perform. Send for Circular No. 126, which gives the capacities of Crane Regulators and rules for arriving at proper sizes.



## TEMPERATURE CONTROL VALVES

Many industrial processes using steam for heat require control of the temperature in a vessel or compartment. In some processes the steam is not allowed to come in direct contact with the material being heated, the heat only of the steam being utilized. The temperature desired may be much lower than the temperature of the steam itself.

The need for a reliable, simplified device which will automatically maintain a desired temperature has been recognized for years. Effective temperature control means a saving in steam and accuracy in the process.

To be effective a device of this kind must be sensitive, because no great variation in temperature above or below that required for the process is allowable.

Nearly all temperature control devices now on the market have a thermostat, actuated by the difference in the expansion of two metals, which operates a pilot valve through a system of multiplying levers. The pilot valve controls the flow of water or air to a diaphragm chamber on the valve controlling the flow of steam. This type of control requires a great deal of attention, fine adjustment and a constant flow of water or compressed air.

We recommend the Crane Temperature Control Valve for use wherever it is desired to automatically control the temperature of a vessel or compartment heated by steam, because it has the following important features: reliability, simplicity of operation, accessibility for inspection, convenience in making repairs, lowest possible cost of operating.

The Crane Temperature Control Valve consists of a readily adjustable indicating thermometer-thermostat electrically connected with a solenoid operating a pilot valve mounted on and controlling the steam valve. The whole device is extremely sensitive and will operate within a variation of one degree. Power for the solenoid may be taken from any lamp socket and the current required to operate it (20 Watts) is used only when the steam valve is closed.

Crane Temperature Control Valves may be used for a variety of purposes as the following list will show: Rubber Vulcanizing, Dry Kilns, Pasteurizing, Drying Apparatus of all Kinds, Laundry and Hotel Water Heaters, Cooking Apparatus of all Kinds, Melting Wax, Lard, etc., Dye Kettles, Railroad Car Heating.

Send for Circular No. 127, which gives details of construction and operation, capacities, etc.

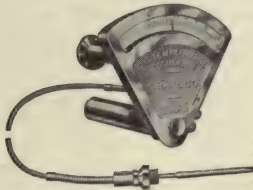
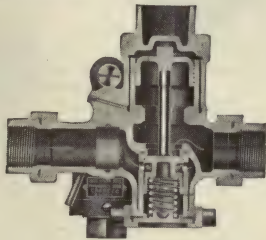
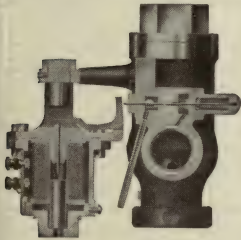
## TEMPERATURE CONTROL VALVES

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS  
AND A TOTAL TEMPERATURE OF 500 DEGREES FAHRENHEIT

BRASS BODIES AND CAPS

UNION ENDS

HARD METAL SEATS AND DISCS



C. C.—S. C.

C. C.—B. C.

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, C. C.—S. C.....Each	251.00	256.00	261.00	276.00	296.00	346.00
Price, C. C.—B. C.....Each	335.00	340.00	345.00	360.00	380.00	430.00

Prices include the Valve, C. C. Strainer and Thermostat, complete.

Type C. C.—S. C. Thermostat is used to control the temperature of a room or compartment and is self-contained.

Type C. C.—B. C. Thermostat is used to control the temperature where a bulb is necessary.

Larger sizes, prices on application.

### SCALES USED ON THERMOSTATS AND RECOMMENDED WORKING RANGES

Scale No. 12, C. C.—S. C. .... Range, 70 to 140 degrees Fahr.

Scale No. 16, C. C.—B. C. .... Range, 115 to 165 degrees Fahr.

Scale No. 2, C. C.—B. C. .... Range, 165 to 215 degrees Fahr.

Scale No. 17, C. C.—B. C. .... Range, 215 to 265 degrees Fahr.

Scale No. 13, C. C.—B. C. .... Range, 265 to 315 degrees Fahr.

Scale No. 8, C. C.—B. C. .... Range, 350 to 480 degrees Fahr.

Scale No. 12 is used on the C. C.—S. C. type only.

All other scales are used on C. C.—B. C. type only.

Send for Circular No. 127, which gives details required for ordering.



## C. C. SELF-CLEANING STRAINERS

FERROSTEEL

FOR STEAM WORKING PRESSURES UP TO  
250 POUNDS

### LIST PRICES

Sizes Inches	CONNECTIONS		EXTRA STRAINER CYLINDERS
	Screwed	Flanged	PERFORATIONS $\frac{1}{64}$ inch, $\frac{1}{32}$ inch and $\frac{3}{64}$ inch
$\frac{1}{8}$			
$\frac{1}{4}$			
$\frac{3}{8}$	2.50		.55
$\frac{1}{2}$	2.50		.55
$\frac{3}{4}$	2.75		.55
1	3.25		.70
$1\frac{1}{4}$	4.50		.80
$1\frac{1}{2}$	5.00		1.00
2	8.00	11.75	1.20
$2\frac{1}{2}$	11.75	15.50	1.70
3	13.00	19.50	2.15
$3\frac{1}{2}$	19.50	24.50	2.75
4	23.00	28.00	3.00
$4\frac{1}{2}$	36.50	43.00	4.75
5	43.00	50.00	5.25
6	55.00	61.00	8.00
8	115.00	126.00	14.00
10	195.00	213.00	18.00
12	280.00	300.00	25.00

\*These sizes made in Brass only. All others of Ferrosteel.

C. C. Self-Cleaning Strainers protect Turbines, Engines, Pumps, Steam Traps, Pressure Regulators, Pressure and Vacuum Heating Systems, Automatic Air Tools, Blasts, Meters, Burners; in short, wherever steam, air or gas is passed through pipe lines, they assure positive, continuous service.

C. C. Self-Cleaning Strainers as listed are suitable for 250 pounds steam or gas working pressure or 400 pounds liquid pressure.

Cast Steel Bodies are supplied for superheated steam and high pressure liquid service at special prices.

Unless otherwise specified C. C. Self-Cleaning Strainers are supplied with Strainer Cylinders having  $\frac{1}{64}$  inch perforations and are suitable for either steam, air or gas service.

When specified for liquid service, Strainer Cylinders have  $\frac{1}{32}$  inch perforations. Extra Strainer Cylinders are frequently desirable in liquid service.

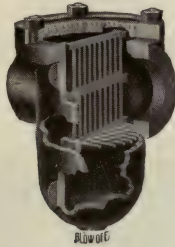
Strainer Cylinders will be supplied on order with  $\frac{1}{16}$ ,  $\frac{1}{8}$ ,  $\frac{3}{16}$  or  $\frac{1}{4}$  inch perforations.

Screwed Connections are furnished unless otherwise specified.

Flange Connections; faced only; drilling extra.

## SEDIMENT TRAPS CAST IRON

FOR WATER WORKING PRESSURES UP TO 250 POUNDS



No. 990

Size Inches	PRICE LIST		DIMENSIONS					
	Screwed	Flanged	Blow-off Tapped	End to End Screwed	Face to Face Flanged	Center of Inlet or Outlet to Bottom Inches	Center of Inlet or Outlet to Top Inches	Diam- eter of Flanges Inches
$\frac{1}{2}$	2.00	Made	$\frac{1}{2}$	3	Made	$3\frac{1}{8}$	2	Made
$\frac{3}{4}$	2.00	in	$\frac{3}{4}$	$3\frac{3}{4}$	in	$4\frac{1}{16}$	$2\frac{5}{8}$	in
1	2.25	Screwed	$\frac{3}{4}$	$3\frac{3}{4}$	Screwed	$4\frac{1}{16}$	$2\frac{5}{8}$	Screwed
$1\frac{1}{4}$	2.50	Ends	1	5	Ends	$5\frac{1}{8}$	3	Ends
$1\frac{1}{2}$	3.50	Only	1	5	Only	$5\frac{1}{8}$	3	Only
2	8.00	12.50	1	7	$10\frac{3}{4}$	$6\frac{5}{8}$	$3\frac{3}{4}$	$6\frac{1}{2}$
$2\frac{1}{2}$	9.00	14.50	1	7	$10\frac{3}{4}$	$6\frac{5}{8}$	$3\frac{3}{4}$	$7\frac{1}{2}$
3	12.00	18.75	$1\frac{1}{4}$	$8\frac{1}{2}$	$12\frac{1}{2}$	$8\frac{7}{16}$	$4\frac{3}{8}$	$8\frac{1}{4}$
$3\frac{1}{2}$	13.00	20.00	$1\frac{1}{4}$	$8\frac{1}{2}$	$12\frac{1}{2}$	$8\frac{7}{16}$	$4\frac{3}{8}$	9
4	15.00	23.50	$1\frac{1}{4}$	10	$14\frac{1}{2}$	$9\frac{1}{2}$	$5\frac{3}{8}$	10
$4\frac{1}{2}$	16.00	26.00	$1\frac{1}{4}$	10	$14\frac{1}{2}$	$9\frac{1}{2}$	$5\frac{3}{8}$	$10\frac{1}{2}$
5	17.50	29.00	$1\frac{1}{2}$	11	$15\frac{1}{2}$	$10\frac{1}{2}$	$5\frac{7}{8}$	11
6	20.00	33.00	$1\frac{1}{2}$	$12\frac{1}{2}$	17	$12\frac{1}{2}$	$6\frac{5}{8}$	$12\frac{1}{2}$
8		65.00	$1\frac{1}{2}$		$21\frac{1}{2}$	$14\frac{3}{4}$	$8\frac{1}{4}$	15

These Sediment Traps are constructed in a strong and substantial manner and will be found especially valuable for use in connection with Steam Traps, Pumps, Injector and Ejector Suction Pipes, Feed Water Lines, etc., by preventing foreign substances from passing through and finding lodgment on Valve Seats, clogging up steam and water nozzles of Injectors and Ejectors and other passages and ports that should necessarily be kept entirely clear and free from such obstructions.

Sizes  $1\frac{1}{2}$  inch and smaller have screwed inlet and outlet connections. On the larger sizes, we can furnish the connections either screwed or flanged.

When traps with flanged ends are ordered, we furnish, without extra charge, the companion flanges and bolts, but no gaskets.

Special prices quoted on larger sizes.

Templates for drilling, page 652.

## EXTRA HEAVY HYDRAULIC SEDIMENT SEPARATORS



Sizes  $1\frac{1}{2}$  to 6 inch, inclusive.

Prices on application.

When ordering or requesting prices, specify size and working pressure, also whether screwed or flanged.

Sediment Separators will be made of Ferrosteeel or Cast Steel, depending upon the pressure they are required for.

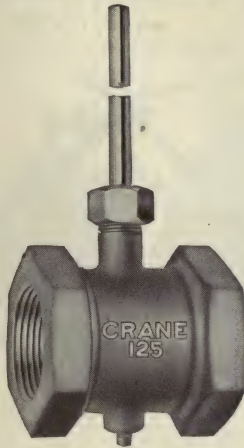


# STANDARD BUTTERFLY VALVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**No. 44  
BRASS**



**No. 380  
IRON BODY  
BRASS TRIMMINGS**

## No. 44

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	3.10	4.40	5.65	6.75	10.00	13.75	21.00

In ordering No. 44 Valves, always specify Brass Butterfly Valves, otherwise sizes 2 inch and larger will be furnished iron body as below.

## No. 380

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5
No. 380, Screwed.....Each	8.00	9.50	12.00	16.00	18.50	28.50
No. 381, Flanged.....Each	9.50	11.50	15.00	19.00	22.00	32.00
End to End, Screwed.....Inches	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{1}{2}$	6	$6\frac{3}{4}$
Face to Face, Flanged.....Inches	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{1}{2}$	6	$6\frac{3}{4}$
Diameter Flanges.....Inches	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10
Size.....Inches	6	8	10	12	14	16
No. 380, Screwed.....Each	42.50					
No. 381, Flanged.....Each	47.00	90.00	125.00	160.00	275.00	350.00
End to End, Screwed.....Inches	$7\frac{1}{2}$					
Face to Face, Flanged.....Inches	$7\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{3}{4}$	$12\frac{1}{2}$	14	16
Diameter Flanges.....Inches	11	$13\frac{1}{2}$	16	19	21	$23\frac{1}{2}$

These Valves are not intended to be steam tight.

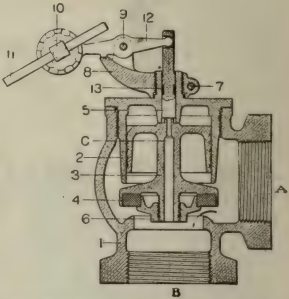
Can be made with a brass stem instead of steel stem, at an extra price.

Templates for drilling, page 650. Price List for drilling, page 141.

FOSTER FLOAT VALVE

FOR WORKING PRESSURES UP TO 125 POUNDS AND FOR WATER OF ANY TEMPERATURE UP TO 212 DEGREES

SIZES 3/4 TO 2 INCH, INCLUSIVE, ALL COMPOSITION  
SIZES 2 1/2 TO 8 INCH, INCLUSIVE, IRON BODY, COMPOSITION TRIMMINGS



Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Screwed.....Each	6.50	8.00	9.50	12.00	20.00	40.00
Flanged.....Each					25.00	45.00
Diameter of Flanges.....Inches					6	7

Size.....Inches	3	4	5	6	8	
Screwed.....Each	60.00	88.00	110.00	150.00		
Flanged.....Each	65.00	93.00	115.00	155.00	200.00	
Diameter of Flanges.....Inches	7 1/2	9	10	11	13 1/2	

Furnished globe or angle as desired.  
Always specify whether globe or angle is wanted.

This Valve is a reliable device for maintaining a constant level of water or other liquid in a tank. Unlike most devices of this kind it is not necessary to place it directly over the tank. It may be placed in the supply line to an open tank at any convenient point and connected with the operating float in the tank by means of a cord or wire.

OPERATION

Inlet is at A, outlet at B. Normally, the main Valve rests on its seat and the Valve 5 is open when water line is below the float.

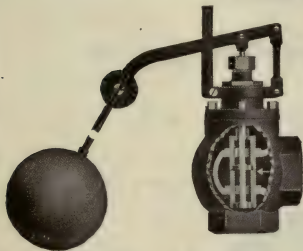
The main Valve is loosely fitted in chamber 2, which allows the water to flow past it, filling the chamber above the piston. Excess leakage escapes from annular space through central part of main Valve.

The water pressure entering at A exerts a pressure on the underside of main Valve and opens it, allowing the water to discharge at B. The flow continues until the float rises and closes Valve 5. Closing Valve 5 allows the water pressure to accumulate in the annular space above main Valve and forces the latter to its seat, thereby stopping all flow from the supply pipe. When the water level in tank falls, the float drops, lifts Valve 5 and allows water in the annular space to escape and open main Valve.

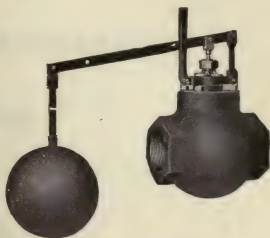
Always install a short length of pipe on the discharge side to prevent pulsation of the float when water is being discharged into the tank.

## BALANCED TANK FLOAT VALVES

SUITABLE FOR COLD WATER WORKING PRESSURES UP TO  
200 POUNDS



No. 993. ANGLE



No. 995. GLOBE

Size Inches	Price Angle or Globe Each	Diameter of Copper Float Inches	Diameter of Flanges Inches	Face to Face Screwed End Inches	Face to Face Flanged End Inches
$\frac{3}{4}$	11.00	7		$3\frac{7}{8}$	
1	13.00	7		$4\frac{1}{8}$	
$1\frac{1}{4}$	14.00	7		$4\frac{1}{4}$	
$1\frac{1}{2}$	16.00	7		$4\frac{7}{8}$	
2	19.00	7		$6\frac{7}{8}$	$7\frac{1}{2}$
$2\frac{1}{2}$	25.00	8	7	8	9
3	31.00	8	$7\frac{1}{2}$	$9\frac{1}{8}$	$9\frac{3}{4}$
$3\frac{1}{2}$	36.00	8	$8\frac{1}{2}$	$9\frac{7}{8}$	$9\frac{3}{4}$
4	42.00	8	9	$9\frac{7}{8}$	$10\frac{5}{8}$
$4\frac{1}{2}$	50.00	10	$9\frac{1}{4}$	$11\frac{1}{4}$	$10\frac{5}{8}$
5	54.00	10	10	$11\frac{1}{4}$	$12\frac{1}{8}$
6	64.00	10	11	$12\frac{1}{4}$	13
7	76.00	10	$12\frac{1}{2}$		$14\frac{5}{8}$
8	86.00	10	$13\frac{1}{2}$		$16\frac{1}{4}$
10	110.00	12	16		$20\frac{1}{4}$
12	150.00	12	19		$22\frac{5}{8}$

The above prices are for either angle or globe, complete with float and levers as shown. Screwed up to 2 inch; either screwed or flanged  $2\frac{1}{2}$  to 6 inch; and flanged only, 7 inch and larger.

Sizes  $\frac{3}{4}$  to  $1\frac{1}{2}$  inch are made of brass; sizes 2 inch and larger have iron body with brass valve, seats and trimmings.

When ordering, state whether angle or globe, screwed or flanged. Unless otherwise specified, Angle Valves will be furnished screwed up to and including 6 inch; larger sizes flanged only.

Drilling of flanges will be extra.

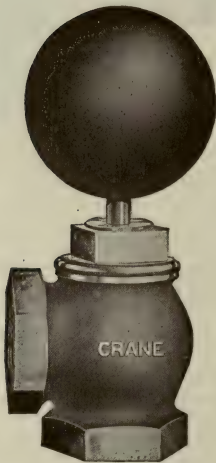
Templates for drilling, page 650. Price List for drilling, page 141.

Valves specially constructed for hot water. Inquiries and orders should specify temperatures. Unless otherwise ordered, Valves for cold water will always be furnished.

Center to end dimensions of Angle Pattern Float Valves, both screwed and flanged ends, are half of the Face to Face dimensions of the Globe Pattern Float Valves.

LOW PRESSURE  
BRASS SAFETY VALVES

WITH IRON BALL



No. 36

BALL WEIGHTED FOR 8 TO 10 POUNDS PRESSURE

Size.....	Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	Each	2.60	3.30	4.50	6.35	8.65

## LOW PRESSURE BRASS POP SAFETY VALVES

FOR STEAM HEATING BOILERS

SET AT ANY PRESSURE SPECIFIED UP TO 20 POUNDS



No. 1160

These Valves are made of brass, and are fitted with best steel springs.

In addition to their extensive use on Steam Heating Boilers, they are also useful on Boiling Kettles, Tanks, etc.

When not otherwise specified we will furnish No. 1160 rough body Valves set at 10 pounds.



No. 1162

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 1160, Rough Body.....Each	5.25	5.25	6.00	6.75	8.25	11.25	26.00	37.50
No. 1162, Finished.....Each	6.00	6.00	6.75	7.75	9.50	13.00	28.00	41.00
No. 1164, Finished and Nickel Plated..Each	6.75	6.75	7.50	8.75	10.50	14.00	30.00	44.00

The outlet holes on all sizes of these Valves are located to blow "downward."

In localities where Boiler Inspector Seal is required and so specified, we will furnish these Valves with lug cast on body and corresponding holes drilled through this lug and the hexagon corners of cap, for attaching wire and seal.



# LOW PRESSURE NON-ADJUSTABLE POP SAFETY VALVES FOR STEAM HEATING BOILERS

THESE VALVES CONFORM WITH THE REQUIREMENTS OF THE  
A. S. M. E. BOILER CODE

SET AT 15 POUNDS PRESSURE

MALLEABLE IRON BODY AND BASE  
NICKEL PLATED

BRASS SEAT AND DISC



No. 1165

Size.....Inches	1	1¼	1½	2	2½	3
Price.....Each	6.00	6.75	8.25	11.25	26.00	37.50

These Valves are made of malleable iron with brass trimmings. Special attention has been paid to the bases, which are rigid and provide ample clearance for the tools, when Valves are installed in difficult places.

These Valves will be furnished locked up in such a way that the popping pressure can not be changed from the original set pressure.

In localities where Boiler Inspector Seal is required and so specified we will furnish these Valves drilled in such a way that wire and seal can be efficiently attached.

If larger size Valves are wanted we will on order furnish our No. 1101, shown on page 232, to conform with the rules of the A. S. M. E. Code for Low Pressure Boilers for which a special price will be charged.

**STANDARD BRASS POP SAFETY VALVES****SET AT ANY PRESSURE SPECIFIED UP TO 125 POUNDS****No. 1152**

Inches .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price .....	Each	8.00	8.00	10.00	12.00	15.00	23.00

WHEN ORDERING THIS STYLE VALVE ALWAYS SPECIFY NO. 1152, AND STATE THE PRESSURE VALVES ARE WANTED SET TO BLOW OFF.

These valves are made without the self-adjusting feature, and for ordinary purposes, where uniform working pressure not exceeding 125 pounds is carried, they answer all requirements. Thousands are in use giving general satisfaction on small stationary, portable, hoisting and threshing engine boilers.

**MUFFLER BRASS POP SAFETY VALVES****SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS****No. 1158**

These Valves are recommended for Steam Road Rollers, Traction, Farm, Portable and Threshing Engine Boilers and all small Stationary Boilers where it is necessary or desirable to muffle the noise of discharging steam.

They are made of brass, with best steel springs, and will subdue the objectionable noise of escaping steam to the greatest possible extent, without retarding or affecting the full relieving capacity of the Valve.

Size .....	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price .....	Each	21.00	26.00	32.00	48.00
Price, with Locked Up attachment ..	Each	26.00	32.00	39.00	55.00

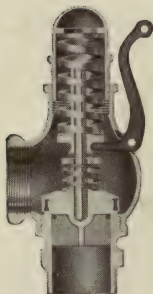
These Valves will be made with female or flanged base, when so ordered, at an extra price.

# BRASS POP SAFETY VALVES

(CRANE PATENT)

FOR STATIONARY BOILERS

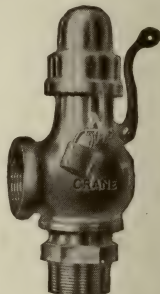
SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS



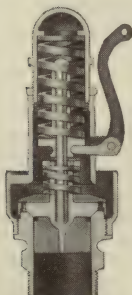
No. 1144 INTERIOR



No. 1144 EXTERIOR



No. 1146 LOCKED UP



No. 1148 INTERIOR



No. 1148 EXTERIOR



No. 1150 LOCKED UP

Nos. 1146 and 1150 are furnished with lock-up attachment but no lock. Locks will be furnished when ordered at an extra price.

These Valves can be made to conform with the A. S. M. E. Boiler Code for pressures up to 150 pounds when so ordered, for which an additional charge will be made. For pressures higher than 150 pounds special valves can be made to the code if ordered in sufficient quantities.

Valves with Special Enlarged or Reduced Inlets for Threshing Engines, made to order at a special price, according to quantity wanted.

# BRASS POP SAFETY VALVES

(CRANE PATENT)

## FOR STATIONARY BOILERS

SET IN ANY PRESSURE SPECIFIED UP TO 250 POUNDS

### PRICE LIST FOR STATIONARY BOILERS

Size Inches	No. 1144 Brass Disc Each	No. 1145 with Jenkins Disc Each	No. 1146 Each	No. 1148 Brass Disc Each	No. 1149 with Jenkins Disc Each	No. 1150 Each
$\frac{1}{2}$	11.00	15.00	12.00	8.00	12.00	9.00
$\frac{3}{4}$	11.00	15.00	12.00	8.00	12.00	9.00
1	13.00	19.50	14.00	10.00	16.00	11.00
$1\frac{1}{4}$	16.00	22.50	17.00	12.00	18.00	13.00
$1\frac{1}{2}$	19.00	25.50	21.00	15.00	21.00	17.00
2	29.00	35.50	31.00	23.00	29.00	25.00
$2\frac{1}{4}$	38.00		40.00	31.00		33.00
$2\frac{1}{2}$	46.00	55.00	49.00	38.00	45.00	40.00

WHEN ORDERING, ALWAYS SPECIFY STYLE NUMBER, AND STATE THE PRESSURE AT WHICH VALVES ARE WANTED SET TO BLOW OFF.

The  $2\frac{1}{4}$  inch Valve has regular  $2\frac{1}{2}$  inch pipe connections.

These Valves will be made with female base or flanged connections when so ordered, at an extra price.

In localities where Boiler Inspector Seal is required and so specified, we will furnish the No. 1146 or No. 1150 Valves with suitable holes drilled for attaching wire and seal in place of pin and lock.

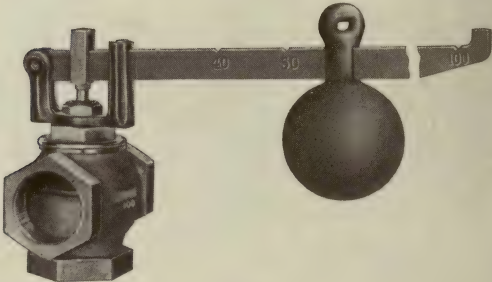
Nos. 1145 and 1149 with Jenkins Disc are suitable for use on air lines.

### VALVES FOR MARINE SERVICE

These Valves, when wanted for pressures lower than 150 pounds to comply with the requirements of the United States Board of Supervising Inspectors of Steam Vessels, will be suitably constructed and made of "Crane Special Brass" at an extra price. Be sure to specify for Marine Service.

STANDARD  
SAFETY VALVES  
ANGLE AND CROSS  
BRASS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS



No. 40

SCREWED

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 40, Cross Safety Valve.....Each	2.20	2.50	3.25	3.90	4.70
No. 42, Angle Safety Valve.....Each		2.50	3.25	3.90	4.70
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 40, Cross Safety Valve.....Each	7.15	9.00	12.50	22.50	33.50
No. 42, Angle Safety Valve.....Each	7.15	9.00	12.50		

Levers are graduated from 40 to 100 pounds. If desired, we can supply with any other graduation to order, not to exceed 100 pounds, at a special price.

Cross Safety Valves, sizes  $1\frac{1}{4}$  inch and larger, will be furnished in Iron, unless Brass is specified.

These Valves should not be confused with Spring Loaded Safety Valves of more recent origin containing pop chambers. They have no positive opening and closing points and must be set 10 to 20 per cent higher than the working pressure regularly carried on the apparatus to which they are connected in order to prevent a continuous leakage past the seat.

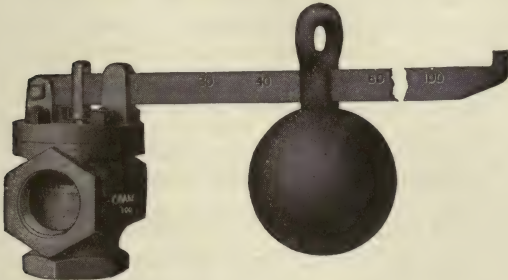


# STANDARD SAFETY VALVES

IRON BODY

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS

**No. 376. SCREWED**

Size.....Inches	1¼	1½	2	2½	3	3½
Price.....Each	5.00	5.80	7.80	13.25	17.25	23.00
Size.....Inches	4	4½	5	6	7	8
Price.....Each	28.75	34.50	41.50	57.75	93.50	132.00

**No. 377. FLANGED**

Size.....Inches	4	5	6	7	8
Price.....Each	34.00	48.00	65.00	100.00	140.00
Diameter of Flanges.....Inches	9	10	11	12½	13½
Face to Face.....Inches	11½	13	14	16	17
Center to Inlet.....Inches	5¾	6½	7	8	8½

Levers are graduated from 30 to 100 pounds. If desired, we can supply any other graduations to order, not to exceed 100 pounds, at a special price.

When so ordered these Valves can be furnished for pressures below 30 pounds.

Sizes 1¼ to 2 inch have brass cap screwed into the body; 2½ inch and up have iron cap bolted to body.

These Valves should not be confused with Spring Loaded Safety Valves of more recent origin containing pop chambers. They have no positive opening and closing points and must be set 10 to 20 per cent higher than the working pressure regularly carried on the apparatus to which they are connected in order to prevent a continuous leakage past the seat.

General dimensions of bodies, same as Cross Valves on page 657.

Templates for drilling, page 650. Price List for drilling, page 141.

## CRANE

### IMPROVED POP SAFETY VALVES

THE PATENTED SELF-ADJUSTING AUXILIARY DISC AND SPRING, operating entirely independently of the main disc and spring, is a feature found only on Crane Pop Safety Valves.

This device automatically regulates the blow-back of the Valve within certain limits and combines the following desirable qualities:

**HIGH DISCHARGING CAPACITY**  
**SMALL BLOW DOWN OF PRESSURE**  
**MINIMUM WASTE OF STEAM**  
**ABSENCE OF WIREDRAWING AT THE SEAT**  
**PROMPT SEATING WITHOUT HAMMERING**

Experience has proved that these features fulfill the demands of modern practice and are essential to efficiency and long life.

The huddling or pop chamber of a Crane Pop Safety Valve is so constructed, that it is practically steam tight when the Valve is closed. As a result the slightest relief of steam past the seat immediately becomes effective and insures full lift, thereby reducing the wire-drawing effect of the steam to a minimum.

To compensate for the restriction past the lip on the main disc, which ordinarily would result in a blow-back greater than is considered economical, the auxiliary device is provided with ports which instantly relieve the pop chamber and furnish automatic control of this condition.

When the velocity of the escaping steam is no longer sufficient to sustain the disc against the tension of the spring, the Valve closes with a snap which insures tight seating. By means of the pop chamber employed in connection with the auxiliary disc and spring device, a steam cushion is formed which allows the main disc to seat tightly, but without destructive hammering.

The high lift and small blow-back of Crane Pop Safety Valves affords quick relief, with the smallest possible loss of steam.

CRANE ENCASED SPRING VALVES are constructed with a casing or chamber enclosing both springs. This type is necessary where a number of Valves are connected to one exhaust or discharge pipe. The spring chamber extends over a large portion of the top surface of the Valve disc and prevents any tendency of back-pressure retarding the action of a Valve, about to pop. This casing also tends to prevent chattering, caused by back-pressure due to long or crooked discharge pipes.

THE IRON BODY AND STEEL SAFETY VALVES DESCRIBED ON PAGES 231 TO 236, CONFORM IN ALL RESPECTS WITH THE REQUIREMENTS OF THE A. S. M. E. BOILER CODE.

## IMPROVED POP SAFETY VALVES

(CRANE PATENT)

All Iron Body Valves are made with either Brass or Monel Metal Bushings. Unless otherwise ordered all Valves will be furnished with Brass Bushings.

All Valves are made with Bevel Seats at an angle of 45 degrees.

Best steel springs are used, with self-adjusting spring discs.

### OUTLET CONNECTION IN BASE CASTING

All Iron Body Valves are so constructed they can be taken apart for examination, cleaning or repairs without disturbing the outlet pipe or removing the Valve from boiler.

**EACH VALVE IS CORRECTLY SET, THOROUGHLY TESTED AND  
GUARANTEED PERFECT BEFORE SHIPMENT**

## DIRECTIONS FOR CLEANING, GRINDING AND ADJUSTING

### IRON BODY POP VALVES

**TO RESET VALVES:** Remove lock (if a locked-up Valve), take out the flat key connecting top cap with stem. Remove the lever pin and lever, lift off the top cap, loosen lock-nut, then

**SCREW PRESSURE PLUG UPWARD TO DECREASE PRESSURE OR  
SCREW PRESSURE PLUG DOWNWARD TO INCREASE PRESSURE**  
then tighten lock-nut and replace parts removed.

These Valves being self-adjusting within reasonable limits, there is no necessity of readjusting the auxiliary to regulate the "Pop" should occasion require moderate changes in the set pressure.

There is, of course, a limit to the range in the capacity of all springs, as they vary according to their strength and the pressure for which they were originally intended.

**TO CLEAN OR GRIND SEAT,** follow the directions as given above; take all tension off spring by screwing upward the pressure plug, then unbolt the bonnet from body of Valve, and all parts are accessible.

The Valves are Ground in the same manner as an ordinary Valve.

In connecting Valves, great care should be used in making joints with red lead, as it lodges on the Valve Seat and prevents tight closing. This, as well as pipe scale and other foreign matter, is frequently found to be the cause of leaky Valves.

### BRASS POP VALVES

To clean or grind seat, remove the cap, lock-nut and casing and grind in same manner as an ordinary Valve. To reset Valves, loosen the lock-nut and screw the cap plug **UP TO DECREASE PRESSURE** and **DOWN TO INCREASE PRESSURE**; then tighten lock-nut.

# IRON BODY POP SAFETY VALVES

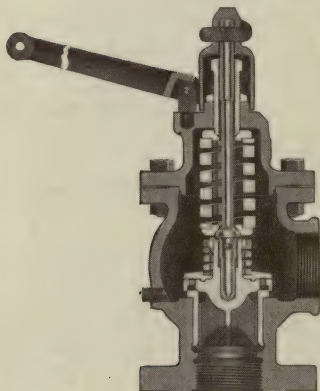
(CRANE PATENT)

## FOR STATIONARY BOILERS

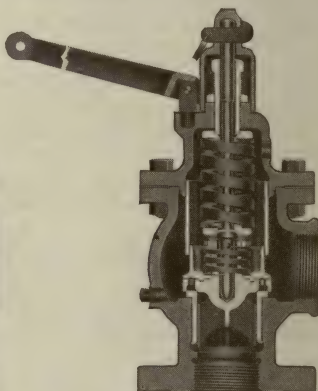
THESE VALVES CONFORM WITH THE REQUIREMENTS OF THE  
A. S. M. E. BOILER CODE

SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS

BRASS OR MONEL METAL SEATS



No. 1101  
PLAIN SPRING TYPE



No. 1105  
ENCASED SPRING TYPE

### PRICE LIST

Size Inches	No. 1101		No. 1105	
	With Brass Seat Each	With Monel Metal Seat Each	With Brass Seat Each	With Monel Metal Seat Each
2½	42.00	48.00	57.00	63.00
3	50.00	57.00	68.00	75.00
3½	68.00	75.00	88.00	95.00
4	75.00	87.00	98.00	110.00
4½	100.00	115.00	125.00	140.00

WHEN ORDERING, ALWAYS SPECIFY THE STYLE NUMBER OF VALVE, AND STATE THE PRESSURE AT WHICH VALVES ARE WANTED SET TO BLOW OFF.

WHEN NOT OTHERWISE SPECIFIED, No. 1105 VALVE WITH BRASS SEAT WILL BE FURNISHED.

These Valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

In localities where Boiler Inspector Seal is required, and so specified, we drill an extra hole in the Stem Key at top of Valve, for attaching the wire and seal. This at no extra charge.

No. 1101 Valves furnished locked up at 50 cents each net extra. No. 1105 Valves are furnished locked up.

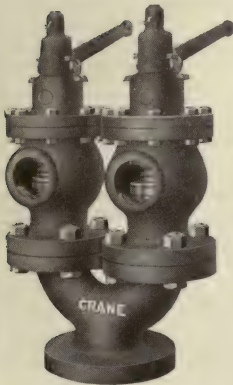
No. 1105 Valves can be furnished with flanged outlets, when so ordered, at a special price.

FOR DIMENSIONS, SEE PAGE 687

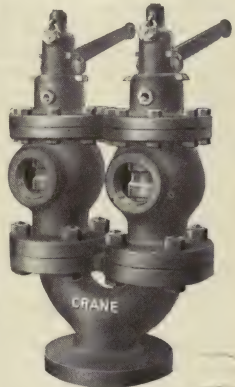


**IRON BODY POP SAFETY VALVES**

(CRANE PATENT)

**TWIN PATTERN FOR STATIONARY BOILERS**THESE VALVES CONFORM WITH THE REQUIREMENTS  
OF THE A. S. M. E. BOILER CODE**SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS****BRASS OR MONEL METAL SEATS****No. 1103**

**No. 1103**  
comprises two No.  
1101 Plain Spring  
Valves mounted on  
Y Base.

**No. 1107**

**No. 1107**  
comprises two No.  
1105 Encased Spring  
Valves, Locked Up,  
mounted on Y Base.

**PRICE LIST. TWIN PATTERN**

Size Inches	No. 1103		No. 1107	
	With Brass Seat Each	With Monel Metal Seat Each	With Brass Seat Each	With Monel Metal Seat Each
2½	118.00	130.00	148.00	160.00
3	142.00	156.00	178.00	192.00
3½	186.00	200.00	226.00	240.00
4	210.00	234.00	256.00	280.00
4½	290.00	320.00	340.00	370.00

WHEN ORDERING, ALWAYS SPECIFY THE STYLE NUMBER AND STATE THE PRESSURE AT WHICH VALVES ARE WANTED SET TO BLOW OFF.

WHEN NOT OTHERWISE SPECIFIED, No. 1107 TWIN TYPE WITH BRASS SEATS WILL BE FURNISHED.

The above prices include two Valves and corresponding Y Base all bolted together as shown in cuts.

No. 1107 Valves can be furnished with Flanged Outlets, when so ordered, at a special price.

For dimensions, see page 687.



## **OUTSIDE SPRING AND YOKE POP SAFETY VALVES**

(CRANE PATENT)

These Valves are designed to meet the exacting requirements of modern practice in the use of high pressure steam and have embodied in their construction all the Crane features that have proved so satisfactory in the past; notably the Patented Auxiliary Disc and Spring. They act quickly to prevent wiredrawing, but without shock even under the high pressures so common to-day.

The main springs are not subjected to the deteriorating effect of high temperatures since they are placed practically outside the body.

These Valves have been given long service tests and will pass the requirements of any adopted boiler rules. Their capacities are equal to the maximum capacities recognized by the A. S. M. E. Boiler Code.

In addition to the auxiliary disc and spring device, fully explained on page 230, particular attention is called to the

### **SUPPLEMENTARY BLOW-BACK REGULATOR**

This provides a means for adjusting the blow-back when changing or regulating the set pressure and permits the user of these pop valves to regulate at will the amount of steam wasted by turning our patented combination encasing sleeve and blow-back regulator. The threads on which this device operates are placed so that they are not affected by the extreme temperatures of the steam, and it is accessible at all times which is not true of devices for similar purposes in other makes of pop safety valves.

### **TO CHANGE OR ADJUST PRESSURES**

Proceed as directed on page 231. Should the valve waste too much steam between opening and closing, turn the regulator in the direction indicated by the arrow on upper edge of sleeve until the desired blow-back is obtained. Should the valve work too close to be practical or simmer too long before popping, turn sleeve in opposite direction.

### **FULL INSTRUCTION CARD FURNISHED WITH EACH VALVE**

The regulation of the blow-back described above can be accomplished without taking the valve apart and with pressure on.

WHEN MADE OF CAST STEEL WITH MONEL METAL SEATS AND DISCS THESE VALVES ARE GOOD FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT. FOR DESCRIPTION, SEE PAGE 236.

# OUTSIDE SPRING AND YOKE POP SAFETY VALVES

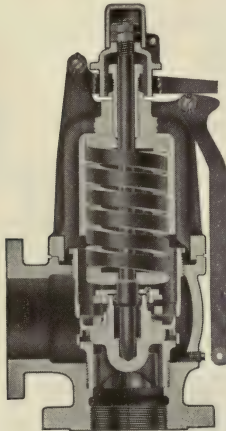
(CRANE PATENT)

WILL FULFILL ALL SAFETY VALVE REQUIREMENTS OF STATIONARY AND  
MARINE BOILER RULES

CAST IRON BODY AND YOKE

BRASS OR MONEL METAL SEAT

SET TO ANY PRESSURE UP TO 250 POUNDS



No. 1117 FLANGED OUTLET

No. 1116 SCREWED OUTLET

Size.....Inches	2½	3	3½	4	4½
No. 1116 & No. 1117—Brass Seat... Each	120.00	135.00	160.00	170.00	225.00
No. 1116 & No. 1117—Monel Metal Seat... Each	126.00	142.00	167.00	182.00	240.00

WHEN ORDERING, ALWAYS SPECIFY THE STYLE NUMBER OF VALVE AND STATE THE PRESSURE VALVES ARE WANTED SET TO BLOW OFF, ALSO WHETHER BRASS OR MONEL METAL SEAT.

VALVES WITH BRASS SEAT WILL ALWAYS BE FURNISHED UNLESS MONEL METAL SEAT IS SPECIFIED. THESE VALVES ARE FURNISHED LOCKED UP.

When so desired guards for the spring can be furnished giving the yoke the appearance of an ordinary bonnet. An extra charge will be made for these guards.

FOR DIMENSIONS, SEE PAGE 688

**CAST STEEL**  
**OUTSIDE SPRING AND YOKE**  
**POP SAFETY VALVES**

(CRANE PATENT)

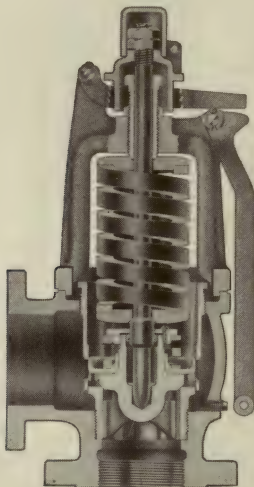
WILL FULFILL ALL SAFETY VALVE REQUIREMENTS OF STATIONARY AND  
MARINE BOILER RULES

CAST STEEL BODY AND YOKE

MONEL METAL SEAT

SET TO ANY PRESSURE UP TO 350 POUNDS

WILL WITHSTAND ANY TEMPERATURE UP TO 800 DEGREES FAHRENHEIT



**No. 1116 A SCREWED OUTLET**

**No. 1117 A FLANGED OUTLET**

**SIZES 2½ TO 4½ INCH, INCLUSIVE**

**PRICES ON APPLICATION**

When ordering always specify the style number of Valve, and state the pressure at which the Valves are to blow off.

When not otherwise specified No. 1116 A Valve will be furnished.

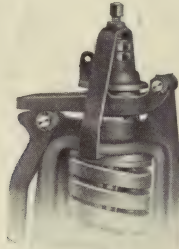
For dimensions, see page 688.

## INSPECTOR TEST YOKES

### FOR POP SAFETY VALVES



ATTACHED TO  
IRON BODY VALVE  
WITH INSIDE SPRING



ATTACHED TO  
IRON BODY VALVE  
WITH OUTSIDE SPRING

These Yokes are easily attached and may be used with any of the following Valves Nos. 1101, 1103, 1105, 1107, 1116, 1117.

They do not interfere with the tension on spring or the original set pressure, consequently, the spring is not injured by undue strain or excessive pressure, and the Valve is ready to resume service without re-adjustment. Screw the bolt down lightly on top of cap, USING ONLY ENOUGH PRESSURE TO PREVENT THE VALVE FROM LIFTING, and it will firmly and tightly hold the Valve to its seat against the required water pressure applied by the Inspector when testing the boiler.

**BE CAREFUL TO REMOVE THE YOKE AFTER THE TEST IS COMPLETED**

Price for Inside Spring Valves.....	Net, Each	.50
Price for Outside Spring Valves.....	Net, Each	.75

## LOCOMOTIVE IMPROVED POP SAFETY VALVES

(CRANE PATENT)

### OPEN POP AND MUFFLER TYPES

These Valves are constructed on the same general principles as our Improved Pop Safety Valves for Stationary and marine boilers, which we have been manufacturing for many years, and the thousands now in constant use and subjected to the severest kind of service will establish

### OUR CLAIMS FOR SUPERIORITY ON ALL POINTS, VIZ.:

MAXIMUM QUALITY AND STRENGTH OF MATERIALS	BEST WORKMANSHIP	LARGE RELIEVING CAPACITY	DURABILITY	OUTSIDE REGULATION FOR EXTREME RANGE IN PRESSURES	NO CHATTERING	NO HAMMERING	NO WIREDRAWING
--	------------------	-----------------------------	------------	--	---------------	--------------	----------------

In addition to the Automatic Auxiliary Valve, as fully explained on page 230, particular attention is called to the

### SUPPLEMENTARY REGULATING RING

Which, in conjunction with the Automatic Auxiliary device, provides means for the greatest possible range in adjustment when changing or regulating set pressures.

This is accomplished by means of the conveniently located

### OUTSIDE "POP" REGULATOR

Which operates the gearing, lowering or raising the adjustment ring as the pressure is increased or decreased, and maintaining the constant feature of a minimum waste or loss of steam between the opening and closing points under the greatest possible range in extreme pressure within the capacity of the spring. This can be done while the boiler is under pressure.

### CHANGING OR ADJUSTING PRESSURES

To change pressure, unscrew the top bolts and remove the cap, slacken lock-nut.

To increase pressure, turn screw plug "Down" (to the right).

To decrease pressure, turn screw plug "Up" (to the left), then tighten lock-nut.

Should the Valve waste too much steam between the opening and closing points, turn the outside Pop Regulator "to the Left" until the desired waste is obtained. Should it work too close, turn Regulator "to the Right" for greater waste.

### FULL INSTRUCTION CARD FURNISHED WITH VALVES

FOR ILLUSTRATIONS AND INSTRUCTIONS WHEN ORDERING, SEE OPPOSITE PAGE



# IMPROVED LOCOMOTIVE POP SAFETY VALVES OPEN AND MUFFLER TYPES (CRANE PATENT)

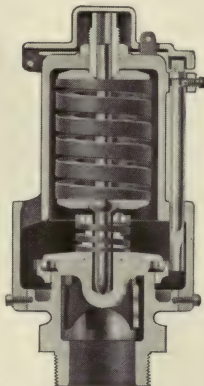
MALLEABLE IRON BODIES

BRASS BASES AND TRIMMINGS

SET TO ANY PRESSURE UP TO 250 POUNDS

**MUFFLER VALVE**

No. 1180 FEMALE BASE  
No. 1181 MALE BASE

**OPEN VALVE**

No. 1183 MALE BASE  
No. 1182 FEMALE BASE

Size Valve—Seat Opening.....	Inches	2½	3
Diameter of Body—Open and Muffler.....	Inches	5¾	6⅝
Overall Height {	Female.....	12	13½
	Male.....	13	14
Size of Base Connection, Iron Pipe {	Female....	2	2½
	Male.....	2½	3
Size of Bore in Male Base.....	Inches	2	2½
Price, Nos. 1180 or 1181.....	Each	80.00	90.00
Price, Nos. 1182 or 1183.....	Each	65.00	75.00

**VALVES FURNISHED LOCKED UP WHEN SO SPECIFIED**

Orders that do not otherwise specify: Valves will be furnished with female base having regular iron pipe size thread and corresponding to one size smaller pipe, as given in above table. For instance, when 3 inch Valves are ordered, female base will be furnished, with 2 ½ inch regular iron pipe thread.

On special orders, the base of Valves will be made either male or female, as required, and to suit any special thread called for in specifications. Special Bushings to screw or press into dome will also be furnished to order according to drawings and specifications submitted.

When ordering, always specify style number and the pressure at which Valves are wanted set to blow off.

## MUFFLER ATTACHMENT FOR POP SAFETY VALVES

CAST IRON



Size. .... Inches	2½	3	3½	4	4½
Price, Screwed ..... Each	12.00	14.00	16.00	19.00	25.00
Price, Flanged ..... Each	15.00	17.00	20.00	23.00	30.00
Diameter Flange ..... Inches	7	7½	8½	9	9¼

These Muffler Attachments are admirably adapted for use in connection with Stationary or Marine Pop Safety Valves.

They may be attached either directly to the outlet of Valve or at the end of discharge pipe, as may be most convenient.

They will effectively subdue the objectionable noise of escaping steam as far as it is possible to do so, without interfering with the operation of Valve, or retarding the free escape of steam.

The several perforated plates provided in the construction of this Muffler Attachment, give a total area of perforations, allowing ample capacity, considerably in excess of the area required to afford free outlet to the steam.

These Attachments are not necessarily confined to use in connection with Pop Safety Valves. They may be applied to the end of any pipe to subdue noisily discharging steam.

Templates for drilling, page 650. Price List for drilling, page 141.

# CAST IRON Y BASES

## FOR TWIN POP SAFETY VALVES



### PRICE LIST

Size Outlets.....Inches	2½	3	3½	4	4½
Faced.....Each	24.00	32.00	38.00	45.00	68.00
Faced and Drilled.....Each	27.00	35.00	42.00	50.00	75.00

### DIMENSIONS

Size Outlets.....Inches	2½	3	3½	4	4½
Diameter Top Flanges.....Inches	7½	8¼	9	10	10½
Size Inlet.....Inches	3½	4½	5	6	7
Diameter Inlet Flange.....Inches	9	10½	11	12½	14
Largest O. D.....Inches	15⅛	16⅝	18⅛	20⅛	21⅝
Face to Face.....Inches	7¾	8½	9	9¾	10¼

AN ADDITIONAL CHARGE WILL BE MADE FOR SPECIAL DIAMETER Y BASE FLANGE

## BRASS WATER AND CYLINDER RELIEF VALVES



No. 1126



No. 1127



No. 1128



No. 1132



No. 1134



No. 1138

Nos. 1126 and 1138 are intended for use as Water Relief Valves. Sizes 2½ inch and smaller will be set at any pressure specified from 10 to 250 pounds and sizes 3 inch, 3½ inches and 4 inch will be set at any pressure specified from 10 to 200 pounds.

The No. 1126 while regularly made with a hand wheel for quick adjustment, can also be furnished for wrench adjustment with a screwed cap for the protection of the adjusting screw, when so ordered. When furnished this way the outside appearance is similar to that of the No. 1134 Valve. No. 1138 is the No. 1126 Valve fitted with lock-up attachment but no lock. Locks are furnished when ordered at an extra price. When boiler inspector's seal is required, suitable holes are drilled for attaching wire and seal in place of lock and pin.

No. 1127 Hydro-Pneumatic Relief Valve is intended for service in connection with water systems operated by means of compressed air, and where a very positive service with only small fluctuations in pressure is wanted, as on hot water heating systems. This style of Valve will be set at any pressure from 10 to 250 pounds.

No. 1128 will be set at any pressure specified from 5 to 500 pounds and is especially adapted for high class service, boiler feed lines, etc. This style of Valve is furnished with female base. Male or flanged base will be made to order at a special price.

Nos. 1132 and 1134 Cylinder Relief Valves will be set at any pressure specified from 5 to 250 pounds. These Valves are recommended for service on Compressor and Steam Cylinder where instantaneous relief is wanted from excess pressures.

## BRASS

# WATER, CYLINDER AND SNIFFING RELIEF VALVES

FOR PUMPS, STEAM ENGINE CYLINDERS, PIPE LINES,  
TANKS, HYDRAULIC PRESSES AND ELEVATORS

## PRICE LIST

Size Ins.	No. 1126		No. 1127	No. 1128		No. 1132		No. 1134		No. 1138	
	Price Fin- ished Each	Price Nickel Plated Each	Price Fin- ished Each	Price Fin- ished Each	Price Nickel Plated Each	Price Fin- ished Each	Price Nickel Plated Each	Price Fin- ished Each	Price Nickel Plated Each	Price Fin- ished Each	Price Nickel Plated Each
½	11.00	12.00	19.00	25.00	26.50	9.00	10.00	11.00	12.00	12.00	13.00
¾	11.00	12.00	19.00	25.00	26.50	9.00	10.00	11.00	12.00	12.00	13.00
1	13.00	14.00	21.00	30.00	32.00	11.00	12.00	13.00	14.00	14.00	15.00
1¼	16.00	18.00	24.00	35.00	37.50	13.00	15.00	16.00	18.00	17.00	19.00
1½	19.00	22.00	28.00	40.00	43.00	16.00	19.00	19.00	22.00	21.00	24.00
2	29.00	32.00	38.00	55.00	59.00	24.00	27.00	29.00	32.00	31.00	34.00
2½	46.00	50.00	57.50	100.00	106.00	40.00	44.00	46.00	50.00	49.00	53.00
3	77.00	85.00									
3½	105.00	115.00									
4	135.00	150.00									

WHEN ORDERING, ALWAYS SPECIFY THE STYLE NUMBER AND STATE THE  
PRESSURE AT WHICH VALVES ARE WANTED SET TO RELIEVE.

Nos. 1126 and 1134 will be furnished with male base up to and in-  
cluding 2½ inch. No. 1126 will be furnished with female base sizes 3 to 4  
inch, inclusive. When required otherwise or flanged they will be fur-  
nished at a special price.

For wrench adjustment, Brass Valves will be made with removable  
Cap as shown in cuts.

To adjust for different pressures, loosen lock-nut, turn hand-wheel or  
pressure screw to the Right to increase pressure; to the Left to decrease  
pressure, then tighten lock-nut.



BRASS HYDRAULIC RELIEF VALVES



No. 1130

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price.....Each	45.00	45.00	50.00	85.00	90.00	130.00	225.00

Hydraulic Relief Valves should be ordered set 15% to 20% higher than the maximum operating pressure of the installation. This will insure against wastage of water caused by the Valves relieving when not necessary to safeguard the system.

The regular Valves will be set at any pressure specified up to the following:

- 1/2 inch Valve up to 5000 pounds pressure.
- 3/4 inch Valve up to 4000 pounds pressure.
- 1 inch Valve up to 3500 pounds pressure.
- 1 1/4 inch Valve up to 3000 pounds pressure.
- 1 1/2 inch Valve up to 2500 pounds pressure.
- 2 inch Valve up to 2000 pounds pressure.
- 2 1/2 inch Valve up to 1800 pounds pressure.

If wanted for pressures higher than these, Valves will be made to order. Price on application.

These Valves are made Extra Heavy, of a special metal, with long and durable springs of best quality steel. They will be furnished with hexagon female bases, as shown in cut above, unless otherwise specified.

They have found extensive use for all purposes where prompt and efficient relief is required in connection with extremely high pressure service, such as Hydraulic Presses, High Pressure Pumping Systems, Hydraulic Elevators, Pipe Lines, etc.

These Valves can not be used as Shock Valves.

# WATER RELIEF VALVES

IRON BODY

BRASS SEAT

FOR PUMPS, STAND PIPES, PIPE LINES, CYLINDERS, ETC.

SET AT ANY PRESSURE SPECIFIED FROM 10 TO 250 POUNDS



Letters and arrow are cast on wrench nut as shown.



To change set pressures: Turn wheel to the left (up) to decrease pressure. Turn wheel to the right (down) to increase pressure.

When wanted for wrench adjustment the square stem nut, as shown above, will be used in place of hand-wheel on this style Valves.

No. 1123

Size Inches	Price, with Brass Seat Each	Diameter of Base Flange Inches	Diameter of Outlet Flange Inches	Center of Outlet to Bottom of Base Flange Inches	Center of Valve to End of Outlet Inches	Total Height Inches
2½	42.00	7½	These sizes made with screwed out- let unless other- wise specified.	5¼	3¾	17¾
3	50.00	8¼		5¾	4¼	18¾
3½	68.00	9		6¾	4¾	20¾
4	75.00	10		6½	5	21
4½	100.00	10½		7¾	6	22½
5	120.00	11	10	7¾	7½	23¾
6	170.00	12½	11	8½	8½	25¾

Unless otherwise specified, Valves with Hand Wheel will always be furnished.

These Valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

Base or outlet flanges, will be made to suit any diameter or thickness required, at an additional price. Price List for drilling, page 433.

When Valves larger than 6 inch are required, we recommend using smaller Valves to equal as nearly as possible, the corresponding capacity of the large Valve. For instance, in place of one 8 inch, use two 6 inch Valves, the combined capacity of which would be slightly in excess of one 8 inch. For convenience, these may be attached to a Y Base, as shown pages 233 and 241.

When Valves are wanted for higher pressures than 250 pounds, prices will be quoted on application.

When these Valves are wanted for hot water service the order should so specify.

## CAST STEEL HYDRAULIC RELIEF VALVES

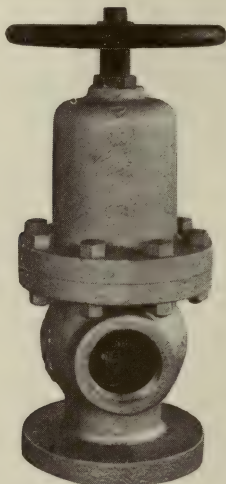
CAST STEEL BODY AND BONNET

MONEL METAL SEAT AND DISC

MADE IN SIZES  
2½ TO 4 INCH,  
INCLUSIVE

FOR USE ON  
HYDRAULIC PRESSES,  
ELEVATORS, PIPE LINES,  
ETC.

PRICES ON APPLICATION



No. 1123 A

Hydraulic Relief Valves should be set 15% to 20% higher than the maximum operating pressure of the installation. This will insure against wastage of water caused by Valves relieving when not necessary to safeguard the system.

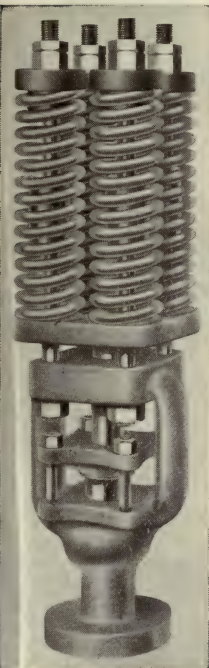
These Valves are made of superior materials with long and durable springs of best quality steel. They are furnished with combination flanged and screwed bases. Hexagon screwed bases furnished when so ordered. Outlets on sizes 2½ to 4 inch furnished screwed unless otherwise ordered.

When Valves larger than 4 inch are required, we recommend using smaller Valves to equal, as nearly as possible, the capacity of the large Valve. For convenience these may be attached to a Y Base as shown on page 241.

THESE VALVES CAN NOT BE USED AS SHOCK VALVES

## EXTRA HEAVY HYDRAULIC CAST STEEL SHOCK ABSORBERS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS



Size	Diameter of Piston Inches	Diameter of Flange Inches	Thickness of Flange Inches
1½	1½	6½	⅞
2	1½	7½	1
2½	2	8¾	1⅛
3	2½	10	1¼
4	3	11½	1⅝

Prices on application.

When ordering or requesting prices, specify size and normal working pressure.

In hydraulic systems having quick closing Valves, the shock on the piping due to sudden stoppage of flow is sometimes very severe, and unless provision is made to cushion the shock, there is danger of rupture in the piping.

These Shock Absorbers consist of a piston loaded with springs which are compressed sufficiently to balance the normal pressure in the line.

Over-pressure due to shock causes further compression which provides a cushion and prevents undue strains on the piping.

The springs are long and liberally proportioned, to provide ample flexibility.

Unless otherwise specified, Shock Absorbers are furnished Flanged with male face, and companion flanges when ordered with Shock Absorbers are furnished with Female Face.

Templates for drilling, page 654. Dimensions of flange faces, page 720.

# EXTRA HEAVY HARD METAL BLOW-OFF VALVES GLOBE AND ANGLE

SCREWED—WITH NON-HEATING WHEEL  
FOR STEAM WORKING PRESSURES UP TO 150 POUNDS



No. 392 ANGLE



No. 392 GLOBE

Size	Inches	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$
Price, Globe or Angle	Each	1.50	2.50	5.00	7.00	10.00

Unless otherwise ordered, the Angle Pattern will be furnished.

To save the discs and seats from wear, Blow-Off Valves should always be opened wide when blowing off.

These Valves may be used wherever an extra heavy globe or angle valve is wanted for handling dirty or gritty water.

## DESCRIPTION

The body and disc of these Valves are made of Hard Metal which is almost as hard as steel and successfully resists the cutting effects of scale, etc.

All other brass parts are made of "Crane Special Brass"; the merits of these metals are described on page 21.

We recommend these Valves for use as Blow-Offs on small high pressure boilers and all other purposes where it is desirable to blow-off dirty water, or water containing grit or sediment under pressure.

We call particular attention to the construction of the disc and seat in these Valves.



## EXTRA HEAVY FERROSTEEL BLOW-OFF VALVES



No. 281 FLANGED  
No. 282 SCREWED

FOR STEAM WORKING  
PRESSURES UP TO  
250 POUNDS



No. 283 SCREWED  
No. 284 FLANGED

Size	Inches	1½	2	3½	4
No. 281, Angle, Screwed	Each	2.00	3.00	10.00	14.00
No. 281, Angle, Flanged	Each		15.00	20.00	28.00
No. 282, Screwed	Each		3.00	10.00	
No. 282½, Flanged	Each		15.00	20.00	
Diameter of Flanges	Inches	4½	7½	8½	
Center to Inlet or Outlet, Flanged	Inches	5	6½	6½	
Face to Face, Flanged, No. 282½	Inches		11	21½	
No. 281, 282½, Center of Valve to Rim of Hand Wheel when Valve is Open	Inches		31½	31½	

These Valves should always be installed so that the pressure will come on the top of the discs. They should also be opened wide when blowing off, so as to save the discs and seats from wear. These are very important points, as they ensure the lasting qualities of the Valves.

### DESCRIPTION

Valves of this style have been generally used for many years with entirely satisfactory results. From the nature of the service, Blow-Off Valves are liable to be cut out by scale or other boiler impurities, and it is essential to have a Valve which may be repaired readily and cheaply. To prevent too frequent repairing we make these Valves with an Iron Seat Ring removable, leaving the seating surface on the outside of the ring. The disc is also made of iron with a throttling lip, which has a tendency to clean the seat. This construction prevents the scale from building between the seat and disc. The use of iron for the service in seat and disc is the result of many years' experience with Valves of this type.

Dimensions for drilling, page 62. Prices List for drilling, page 52.

### EXTRA SEATS AND DISCS (NET)

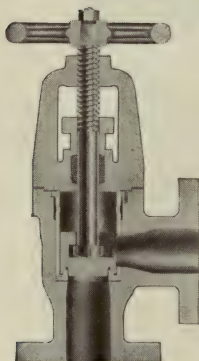
Size	Inches	1½	2	3½	4
Extra Seat	Each	.50	.40	.50	.60
Extra Disc	Each	.65	.75	.90	1.10

**EXTRA HEAVY**

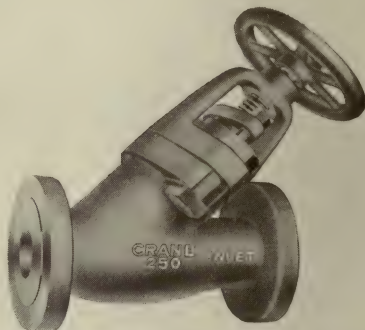
**FERROSTEEL QUICK REPAIR**

**BLOW-OFF VALVES**

**FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**No. 396 $\frac{1}{2}$  ANGLE**



**No. 399 $\frac{1}{2}$**

These Valves are **MADE TO ORDER ONLY**. They are made with ferrosteel body and bonnet, Hard Metal renewable seat and renewable iron disc.

Seat may be slipped into body (no threads) and has an opening the same size as the inlet of Valve.

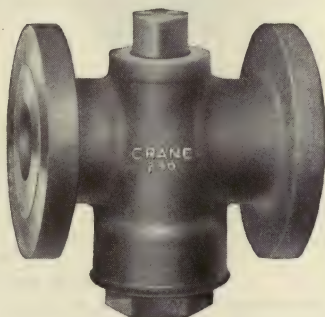
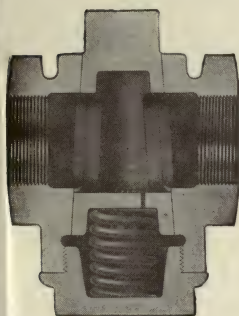
Cranite gaskets at bonnet and seat joints.

When made with Cast Steel body and bonnet and Monel Metal renewable seat these Valves are good for steam working pressures up to 350 pounds.

**PRICES ON APPLICATION**

**EXTRA HEAVY**  
**ALL IRON**  
**STRAIGHT-WAY BLOW-OFF COCKS**  
**WITH COMPENSATING SPRING**

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS  
 THE SPRING AUTOMATICALLY TAKES UP WEAR



Size.....	Inches	1½	2	2½
No. 316 Screwed (Without Wrench).....	Each	9.00	11.00	18.00
No. 317 Flanged (Without Wrench).....	Each	11.00	13.00	20.00
Wrench.....	Each	.70	.80	1.00
Face to Face, Flanged.....	Inches	6½	7½	8½
Diameter of Flanges.....	Inches	6	6½	7½

Flanged Blow-Off Cocks are always furnished faced only unless otherwise specified.

Templates for drilling, page 652. Price List for drilling, page 152.

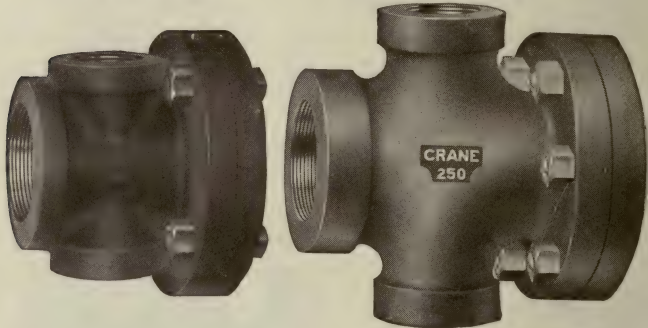
**THE COMPENSATING SPRING**

Which is located between the plug and the cap automatically takes up wear and holds the plug securely in place at all times, thereby preventing the accumulation of scale, sediment, etc., which would tend to impair the ground bearing surfaces of the plug and body.

**BLOW-OFF CROSSES**  
**CAST IRON**

**STANDARD: FOR STEAM  
WORKING PRESSURES  
UP TO 125 POUNDS**

**EXTRA HEAVY: FOR STEAM  
WORKING PRESSURES  
UP TO 250 POUNDS**



**LIST PRICES OF STANDARD**

Size.....Inches	2½×1½	2½×2	2½×2½	3×1½	3×2	4×2
Price.....Each	9.00	9.00	9.00	10.00	10.00	12.00
Size.....Inches	4×2½	5×2½	5×3	6×2½	6×3	
Price.....Each	12.00	18.00	18.00	27.00	27.00	

**LIST PRICES OF EXTRA HEAVY**

Size.....Inches	2½×2½	3×2	4×2	4×2½
Price.....Each	12.00	13.50	16.00	16.00

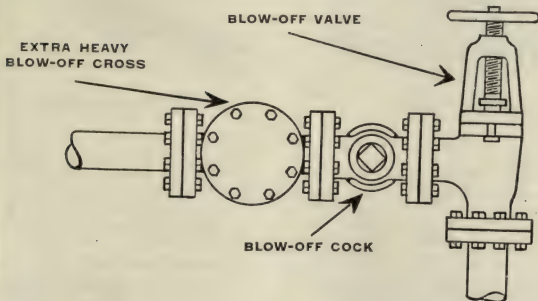
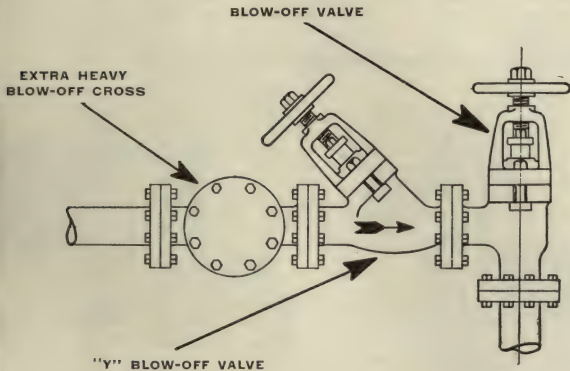
The utility and convenience of this special fitting for feeding and blowing-off boilers will recommend itself.

It is most conveniently placed in the position as shown in cut. The large openings on the run are of same size.

The reduced openings are usually of one size, but can be made to suit requirements. The reduced top inlet is used for feeding the boiler. To the lower reduced outlet the Blow-off Valve or Cock is connected. The blind flange is removable for cleaning out purposes.

Other sizes Extra Heavy Blow-off Crosses made to order. Prices on application.

## HOW TO INSTALL VALVES FOR BLOW-OFF LINES



Every blow-off outlet of each boiler in a battery should be equipped with a blow-off cock, or a Y blow-off valve, between the boiler and the blow-off valve, as shown above.

When blowing off a boiler, the cock or Y valve should be opened first, and the blowing-off operation controlled by the blow-off valve. When through blowing off, the blow-off valve should be closed first and then the cock or Y valve.



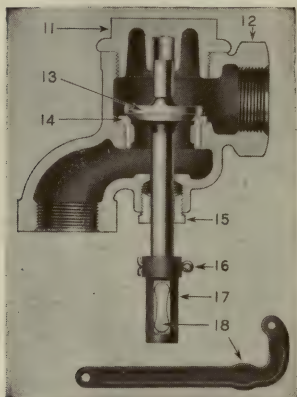
# LOCOMOTIVE ASH-PAN BLOWER VALVE

## EXTRA HEAVY

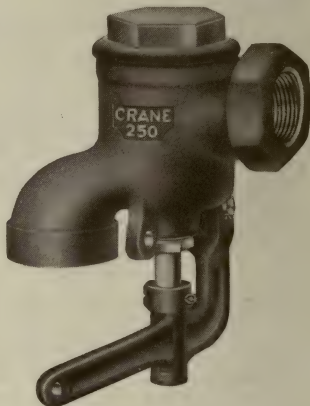
MALLEABLE IRON BODY

HARD METAL DISC AND SEAT  
OR STEEL DISC AND SEAT

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



INTERIOR VIEW



EXTERIOR VIEW

No. 1838

SIZE OF VALVE SEAT OPENING  $1\frac{3}{4}$  INCHES, WITH BEVELED SEAT  
SIZE OF BOILER AND OUTLET CONNECTION,  $1\frac{1}{2}$  INCH, FEMALE

MADE IN  $1\frac{1}{2}$  INCH SIZE ONLY

Size.....	Inches	$1\frac{1}{2}$
Price, Hard Metal Disc and Seat.....	Each	16.00
Price, Steel Disc and Seat.....	Each	32.00

### REPAIR PARTS

11 CAP  
12 BODY  
13 DISC

14 BODY RING  
15 STUFFING BOX GLAND  
16 COTTER PIN

17 LEVER YOKE  
18 LEVER

IT IS IMPOSSIBLE FOR THIS VALVE TO STICK OPEN; IT CLOSSES AUTOMATICALLY WITH THE PRESSURE. ALL WEARING PARTS ARE READILY RENEWABLE.

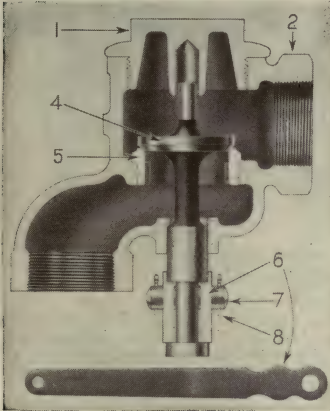
# LOCOMOTIVE BLOW-OFF VALVE

## EXTRA HEAVY

MALLEABLE IRON BODY

HARD METAL DISC AND SEAT  
OR STEEL DISC AND SEAT

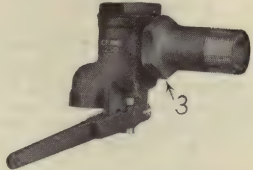
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



INTERIOR VIEW



No. 1840  
EXTERIOR VIEW



No. 1842  
EXTERIOR VIEW

SIZE OF VALVE SEAT OPENING  $2\frac{1}{8}$  INCHES, WITH BEVELED SEAT  
SIZE OF BOILER AND OUTLET CONNECTION, 2 INCH

MADE IN 2 INCH SIZE ONLY

Size .....	Inches	2
No. 1840, Hard Metal Disc and Seat .....	Each	18.00
No. 1840, Steel Disc and Seat .....	Each	36.00
No. 1842, Hard Metal Disc and Seat .....	Each	20.00
No. 1842, Steel Disc and Seat .....	Each	38.00

### REPAIR PARTS

1 CAP	4 DISC	7 LEVER PIN
2 BODY FOR No. 1840	5 BODY RING	8 COTTER PIN
3 BODY FOR No. 1842	6 LEVER	

UNLESS OTHERWISE SPECIFIED, VALVES WITH HARD METAL DISC AND SEAT WILL BE FURNISHED.

IT IS IMPOSSIBLE FOR THIS VALVE TO STICK OPEN; IT CLOSES AUTOMATICALLY WITH THE PRESSURE. ALL WEARING PARTS ARE READILY RENEWABLE.

This type of Valve has been thoroughly tried out, and the excellent service it is giving has resulted in its adoption as a Standard by several prominent Railroads.

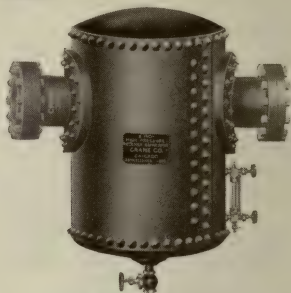
The comparatively low price and durable form of construction, combined with superior grades of material used, strongly recommend this as the most desirable and easiest operated Blow-Off Valve on the market.

# STEAM AND OIL SEPARATORS

CRANE PATENT



No. 03  
LOW PRESSURE  
OIL SEPARATOR



No. 014  
EXTRA HEAVY STEAM  
SEPARATOR

## OIL SEPARATORS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

## STEAM SEPARATORS

STANDARD: FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

EXTRA HEAVY: FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

CAST STEEL: FOR SUPERHEATED STEAM WORKING PRESSURES UP

TO 350 POUNDS AND A TOTAL TEMPERATURE OF

800 DEGREES FAHRENHEIT

With reference to cuts on following pages: the design of these Separators is based upon the most approved and scientific principles.

Their construction covers all the desirable features and essential points that have suggested themselves during the course of our highly successful tests and their continued satisfactory performance.

We do not hesitate to offer this superior line of Separators in competition with any Steam or Oil Separating Devices on the market.

They have large areas and ample baffling surfaces, affording the highest degree of efficiency with the slightest loss in pressure.

## HORIZONTAL SEPARATOR

It will be observed that the corrugations on the baffle plate do not run vertically but at an angle to the rising current of steam. This angle affords ready drainage and at the same time effectually prevents the steam from picking up any globules of water and carrying them over the top of baffle plate.

The steam on entering strikes the corrugated baffling plate and freeing itself from the entrained water, rises naturally over the top, where it sweeps around the curved walls of the head, is again deflected against the corrugated surface on the opposite side of the baffle, and then passes out to the engine in as dry condition as can be obtained through mechanical separation.

With the exception of the slight modification in the form of baffle plate in the larger sizes, this description applies equally as well to the efficiency of Separators in the elimination of oil and water from exhaust steam.

## VERTICAL SEPARATOR

The same general ideas are carried out, the change in form necessitating, of course, a modification of the details in construction.

All vertical separators are the top inlet type. Vertical separators with bottom inlet made to order. Prices on application.

FOR SECTIONAL ILLUSTRATIONS, SEE PAGES 257, 258

# ILLUSTRATING SECTIONAL VIEWS OF THE VARIOUS TYPES OF STEAM AND OIL SEPARATORS

(PATENTED)



SIDE SECTION

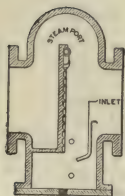


TOP SECTION

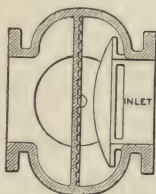


END SECTION

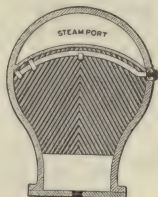
Nos. 01, 07, 011



SIDE SECTION



TOP SECTION

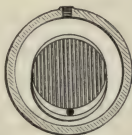


END SECTION

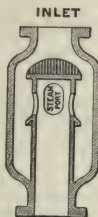
No. 03



SIDE SECTION OF BAFFLE



TOP SECTION OF BAFFLE



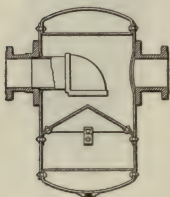
END SECTION OF BAFFLE

Nos. 05, 09, 013

## EXTRA HEAVY RECEIVER STEAM SEPARATORS

STEEL PLATE SHELL AND FERROSTEEL SEPARATING AND RECEIVER HEADS  
(PATENTED)

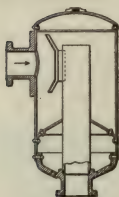
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



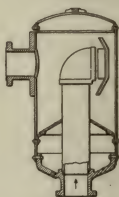
No. 014  
HORIZONTAL



No. 017  
TOP INLET  
VERTICAL

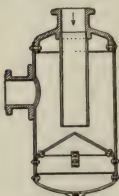


SIDE INLET



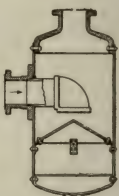
BOTTOM INLET

No. 019 ANGLE



TOP INLET

No. 020 ANGLE



SIDE INLET

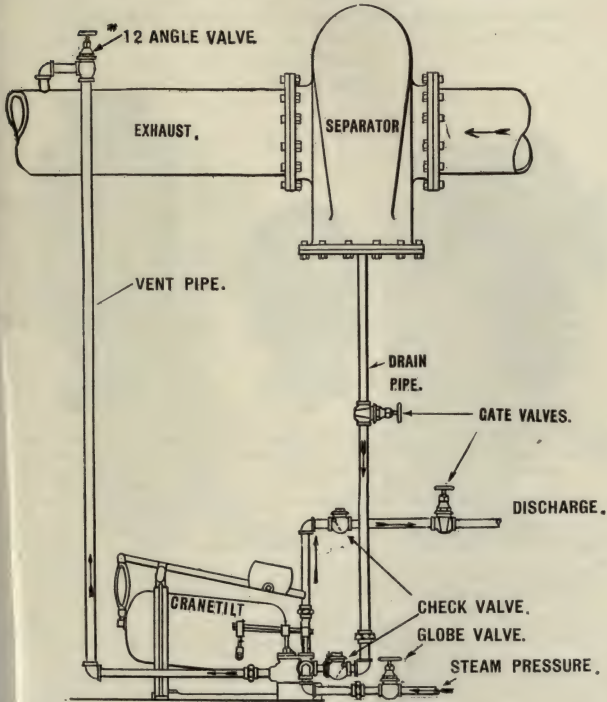
The advantages of our Combined Separators and Receivers will be readily appreciated.

Receiver Separators of suitable capacity, when placed close to the engine, act as a steam reservoir, and maintain a steady flow through the pipe, regardless of any sudden demand made by the engine, by reason of fluctuating loads, thereby preventing vibration and the possibility of serious damage resulting therefrom, by the shaking and jarring of building, walls and other parts of the plant.

In addition to furnishing dry steam to engine, they also provide storage capacity in case of a sudden influx of water, which might be too great for the drainage system to take care of with the promptness such conditions would require.



**AUTOMATIC DRAINING SYSTEM**  
 AS APPLIED TO  
**CRANE VACUUM OIL SEPARATORS**  
 USING  
**CRANETILT VACUUM TRAP**



USE SWING CHECK VALVES IN ALL CASES  
 SET TRAP LEVEL

PRICES ON APPLICATION

All Oil, Steam and Air Separators to give best efficiency should be automatically drained. Every class of separator requires the correct trap for Automatic Drainage. Cranetilt Non-Return, Lifting and Vacuum Traps are particularly adapted to give the best service. Let us handle your separation and drainage problems.

## OIL SEPARATORS

FOR THE ELIMINATION OF OIL AND WATER FROM EXHAUST STEAM  
AND VACUUM LINES

(PATENTED)

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

CAST IRON



**No. 01 HORIZONTAL**  
SIZES 10 INCH AND  
SMALLER



**No. 03 HORIZONTAL**  
SIZES 12 INCH AND  
LARGER



**No. 05 VERTICAL**  
TOP INLET  
SIZES 1½ TO 12 INCH,  
INCLUSIVE

Size.....Inches	1½	2	2½	3	3½	4	4½
Price, Horizontal or Vertical...Each	24.00	28.00	34.00	42.00	50.00	58.00	68.00
Size.....Inches	5	6	7	8	9	10	12
Price, Horizontal or Vertical...Each	76.00	98.00	116.00	134.00	152.00	170.00	200.00
Size.....Inches	14	15	16	18	20	22	
Price, Horizontal only..Each	250.00	300.00	325.00	450.00	550.00	700.00	
Size.....Inches	24	26	28	30	36		
Price, Horizontal only..Each	850.00	1000.00	1300.00	1600.00	2250.00		

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

The above prices include Water Gauge, Drain Valve and Nipple, also the drilling of flanges for all sizes including Companion Flanges and Bolts, but no Gaskets for sizes up to and including 12 inch, but do not include Companion Flanges, Bolts or Gaskets for sizes 14 inch and larger.

The Flange on bottom of the No. 03 Separator may be removed, and the baffle plate examined and thoroughly cleaned by hand, if necessary.

For general dimensions, see page 689.

Templates for drilling, page 650.

For further description and sectional illustrations, see pages 256, 257.

# STANDARD STEAM SEPARATORS

(PATENTED)

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

CAST IRON



No. 07 HORIZONTAL

No. 09 VERTICAL  
TOP INLET

Size.....Inches	1½	2	2½	3	3½	4	4½
No. 07 and No. 09.....Each	24.00	28.00	34.00	42.00	50.00	58.00	68.00
Size.....Inches	5	6	7	8	9	10	12
No. 07 and No. 09.....Each	76.00	98.00	116.00	134.00	152.00	170.00	200.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

We will furnish 1 and 1¼ inch Separators made from same patterns and at same price as 1½ inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

For general dimensions, see page 690.

Templates for drilling, page 650.

For further description and sectional illustrations, see pages 256, 257.

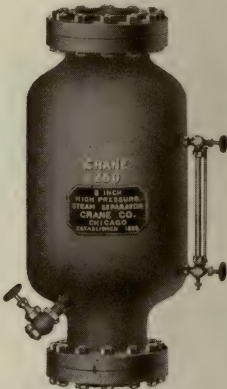
EXTRA HEAVY  
STEAM SEPARATORS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FERROSTEEL



No. 011 HORIZONTAL



No. 013 VERTICAL  
TOP INLET

Size.....Inches	1½	2	2½	3	3½	4	4½
No. 011 and No. 013 . . . Each	26.50	31.00	37.50	46.00	55.00	64.00	75.00
Size.....Inches	5	6	7	8	9	10	12
No. 011 and No. 013 . . . Each	84.00	108.00	128.00	147.00	187.00	187.00	220.00

We will furnish 1 and 1¼ inch Separators made from same patterns and at same price as 1½ inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

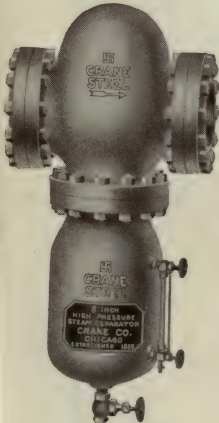
For general dimensions, see page 691.

Templates for drilling, page 652.

For further description and sectional illustrations, see pages 256, 257.

## EXTRA HEAVY CAST STEEL STEAM SEPARATORS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND  
A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT



No. 011 STEEL  
HORIZONTAL



No. 013 STEEL  
VERTICAL  
TOP INLET

Size.....Inches	1½	2	2½	3	3½	4	4½
No. 011 S and No. 013 S..Each	70.00	75.00	80.00	90.00	105.00	115.00	130.00
Size.....Inches	5	6	7	8	9	10	12
No. 011 S and No. 013 S..Each	140.00	175.00	200.00	250.00	375.00	400.00	500.00

We will furnish 1 and 1¼ inch Separators made from same patterns and at same price as 1½ inch size.

The above prices include Water Gauge, Drain Valve and Nipple, also Companion Flanges and Bolts, but no Gaskets.

For general dimensions, see page 691.

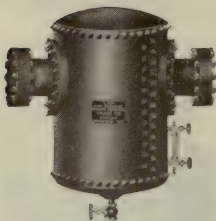
Templates for drilling, page 652.

For further description and sectional illustrations, see pages 256, 257.

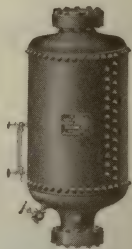


## EXTRA HEAVY RECEIVER STEAM SEPARATORS

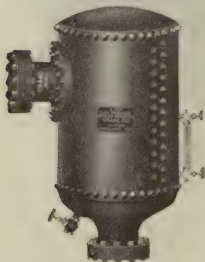
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS  
(PATENTED)



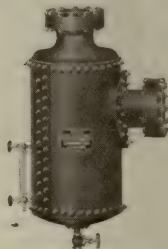
**No. 014  
HORIZONTAL**  
SIZES 4 TO 20 INCH, INCLUSIVE



**No. 017  
VERTICAL**  
SIZES 4 TO 20 INCH, INCLUSIVE



**No. 019**                      **ANGLE**  
SIZES 4 TO 20 INCH, INCLUSIVE



**No. 020**

RIVETED STEEL PLATE SHELL  
WITH FERROSTEEL OR STEEL PLATE HEAD

No. 017, sizes 6 inch and smaller are made entirely of Ferrosteel.

CAN BE CONSTRUCTED SO THAT STEAM MAY ENTER AT TOP,  
BOTTOM OR SIDE:

INQUIRIES SHOULD STATE DIRECTION OF FLOW

PRICES ON APPLICATION

For general dimensions, see page 692.

Templates for drilling, page 652.

For further description and sectional illustrations, see pages 256 and 258.

WE ALSO MAKE THESE RECEIVER STEAM SEPARATORS TO ORDER, WITH CAST STEEL SEPARATING AND RECEIVER HEADS OR STEEL PLATE HEAD AND STEEL PLATE SHELL, SUITABLE FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT.

PRICES ON APPLICATION

## EXTRA HEAVY, DISTRIBUTING RECEIVER STEAM SEPARATOR

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 021

RIVETED STEEL PLATE SHELL

SADDLE NOZZLES, HEADS AND BASE MADE OF FERROSTEEL

These Combined Receivers and Steam Separators can be furnished to conform to various designs and specifications. The above cut is intended merely to give a general idea of construction.

They may be constructed so that steam will enter from the side or top, and outlets can be taken from any desired point in the upper section.

WHEN ORDERING OR REQUESTING PRICES, SUBMIT DRAWINGS, STATE WORKING PRESSURE AND FOR WHAT SERVICE REQUIRED,

MADE IN SIZES 10 INCH AND LARGER

PRICES ON APPLICATION

WE ALSO MAKE THESE RECEIVER STEAM SEPARATORS TO ORDER, WITH CAST STEEL SEPARATING AND RECEIVER HEADS OR STEEL PLATE HEAD AND STEEL PLATE SHELL, SUITABLE FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT.

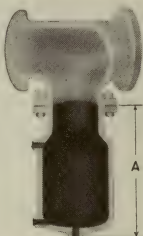
PRICES ON APPLICATION

## CAST IRON DRIP POCKETS FOR STEAM MAINS

**STANDARD:** FOR STEAM WORKING PRESSURES UP TO 125 POUNDS  
**EXTRA HEAVY:** FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



FOR VERTICAL PIPE



FOR HORIZONTAL PIPE

FOR HORIZONTAL AND  
VERTICAL PIPE

Size	PRICE LIST				DIMENSIONS	
	STANDARD		EXTRA HEAVY		A Height of Drip Pocket Inches	Size of Drain Connection Inches
	With Faced Flanges Each	With Faced and Drilled Flanges Each	With Faced Flanges Each	With Faced and Drilled Flanges Each		
Ins.						
2½	19.00	20.00	19.00	20.00	13	¾
3	21.00	22.00	21.00	22.00	14	1
3½	23.00	24.00	23.00	24.00	16	1
4	24.00	26.00	24.00	26.00	16	1
4½	26.00	28.00	26.00	28.00	18	1¼
5	28.00	30.00	28.00	30.00	18	1¼
6	35.00	37.00	35.00	37.00	20	1¼
7	47.00	50.00	47.00	50.00	24¼	1¼
8	52.00	55.00	52.00	55.00	24¼	1¼
9	72.00	75.00	72.00	75.00	28	1½
10	77.00	80.00	77.00	80.00	28	1½
12	115.00	120.00	115.00	120.00	32	1½

**DIFFERENT DISCOUNTS APPLY TO THE ABOVE LIST PRICES OF STANDARD AND EXTRA HEAVY DRIP POCKETS.**

**EXTRA HEAVY DRIP POCKETS FURNISHED TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT.**

These Attachments not only serve as drainage collectors, but also keep the piping clear of pipe scale, dirt and other foreign matter that would otherwise accumulate and cause trouble in new installation work.

Excepting sizes above 12 inch, we always recommend using **FULL SIZE DRIP POCKETS**, corresponding to the size pipe to which they are connected, thus avoiding any possibility of water being carried beyond them, as would very likely happen by using reduced openings or smaller size Pockets.

The 12 inch Drip Pocket is large enough to take care of the condensation in steam lines from 14 to 24 inch, inclusive. In using this Drip Pocket on larger sizes than 12 inch, it will be necessary to use a reducing fitting to conform to the 12×19 or 12×20½ flange on the Drip Pocket. Drip Pockets will be furnished faced only, unless otherwise ordered.

Prices do not include the flanged fittings or bolts shown in above cuts.

Drip Pockets will be tapped for water gauge. Water Gauge will be furnished when ordered, at an extra price.

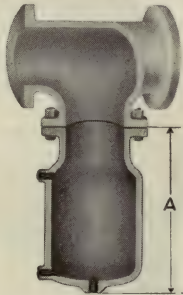
Diameter of Flanges and Templates for drilling, for Standard, see page 650; for Extra Heavy, see page 652.

## EXTRA HEAVY CAST STEEL DRIP POCKETS FOR STEAM MAINS

FOR SUPERHEATED STEAM UP TO 350 POUNDS WORKING PRESSURE AND A  
TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT



FOR VERTICAL PIPE



FOR HORIZONTAL PIPE

FOR HORIZONTAL AND  
VERTICAL PIPE

Size Inches	PRICE LIST		DIMENSIONS	
	With Faced Flanges Each	With Faced and Drilled Flanges Each	A Height of Drip Pocket Inches	Size of Drain Connection Inches
2½	18.00	20.00	13	¾
3	20.00	23.00	14	1
3½	23.00	26.00	16	1
4	26.00	29.00	16	1
4½	31.00	34.00	18	1¼
5	34.00	37.00	18	1¼
6	42.00	46.00	20	1¼
7	51.00	56.00	24¼	1¼
8	60.00	65.00	24¼	1¼
9	71.00	76.00	28	1½
10	84.00	90.00	28	1½
12	103.00	110.00	32	1½

These Attachments not only serve as drainage collectors, but also keep the piping clear of pipe scale, dirt and other foreign matter that would otherwise accumulate and cause trouble in new installation work.

Excepting sizes above 12 inch, we always recommend using FULL SIZE DRIP POCKETS, corresponding to the size pipe to which they are connected, thus avoiding any possibility of water being carried beyond them, as would very likely happen by using reduced openings or smaller size Pockets.

The 12 inch Drip Pocket is large enough to take care of the condensation in steam lines from 14 to 24 inch, inclusive. In using this Drip Pocket on larger sizes than 12 inch, it will be necessary to use a reducing fitting to conform to the 12×20 ½ flange on the Drip Pocket. Drip Pockets will be furnished faced only, unless otherwise ordered.

Prices do not include the flanged fittings or bolts shown in above cuts. Drip Pockets will be tapped for water gauge. Water Gauge will be furnished when ordered, at an extra price.

Diameter of Flanges and Templates for drilling, page 652.



**SPECIAL 36 INCH HORIZONTAL RELIEF VALVE**

**SEE PAGES 204 AND 205 FOR BACK PRESSURE AND EXHAUST RELIEF VALVES**



## CRANETILT STEAM TRAPS

PATENTED  
PATENTS PENDING

### NON-RETURN, DIRECT RETURN, THREE VALVE LIFTING AND VACUUM

WILL WORK ON PRESSURES UP TO 250 POUNDS  
PER SQUARE INCH

#### CRANETILT STEAM TRAPS

Will handle condensation from all sources and conditions of service, and under any pressure of steam up to 250 pounds.

Their discharging capacities are much greater than any other style Tilt Trap now on the market, and the Non-Return will handle ten times more water than bucket, pot or float traps having equal size pipe connections.

The Direct Return will automatically return all condensations, at any pressure or temperature, directly back into the boiler, and deliver feed water to the boiler as a feed pump.

Cranetilt Three Valve Traps are designed to be used as Lifting, Vacuum or Metering Traps.

These traps are especially adapted for use on return lines handling condensation under varying pressures, especially where the pressure will vary from a vacuum to high steam pressure.

#### CONSTRUCTIONAL REASONS WHY CRANETILT ARE SUPERIOR TO ALL OTHER STEAM TRAPS

**THE RECEIVING OR TILTING TANK** is made of malleable iron, cast in one piece of uniform thickness; it is perfectly balanced and combines great strength and durability. These Tanks are tested to 800 pounds hydraulic pressure per square inch and are fully capable of withstanding the severe strains to which Tilting Traps are subjected, overcoming entirely the troubles which heretofore have been experienced with other style tanks.

**ALL OPERATING PARTS ARE ON THE OUTSIDE**, easily accessible for examination or repairs, and are very simple in construction. The trunnions and all interior passages throughout the Traps have full pipe size openings. The tilting movement indicates perfect working. Its powerful mechanism insures positive action to all working parts, eliminating every possibility of binding or sticking at any point.

**THE DISCHARGE AND DUPLEX VALVES** are of special design and have exceptionally large openings. They are entirely frictionless and absolutely perfect in action. The body and bonnet are of extra heavy cast iron. The brass working parts are made of "Crane Hard Metal," which has wearing qualities almost equal to steel and successfully resists the cutting effects of steam and water.

#### WIDE RANGE OF APPLICATION

As Cranetilt Traps, both Non-Return and Direct Return, are adapted to such a wide range of application, we do not attempt to illustrate or fully describe the varied and almost unlimited conditions of service which they are capable of fulfilling. The principle and operation being practically alike in nearly all cases, it will be understood that the location of Trap, arrangements of piping, etc., may vary to suit the requirements and local conditions covering each application.

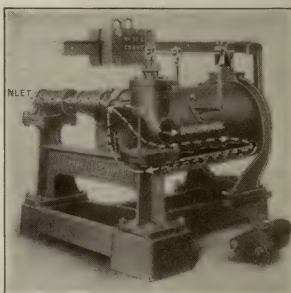
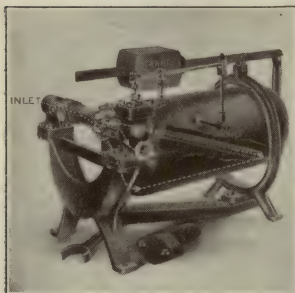
#### TRAP PROBLEMS

Customers having complex trap problems to overcome are requested to submit fully described conditions, with sketch if possible, and we shall be pleased to furnish complete information.

## CRANETILT STEAM TRAPS

### NON-RETURN

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



Nos. 30, 32, 33, 34, 35

Nos. 36, 37, 38, 39

### SERIES 30—PRICE LIST

PIPE CONNECTIONS	Number of Trap	List Price, Including Sediment Trap and Wrench	Approximate Shipping Weight
Size of Inlet and Outlet  Inches			Pounds
$\frac{1}{4}$	30	32.50	95
$\frac{1}{2}$	32	55.00	170
$\frac{3}{4}$	33	75.00	250
1	34	100.00	320
$1\frac{1}{4}$	35	145.00	510
$1\frac{1}{2}$	36	210.00	850
2	37	300.00	1,175
$2\frac{1}{2}$	38	425.00	1,750
3	39	550.00	2,600

FOR RATINGS AND CAPACITIES, SEE PAGE 271

### MERITS OF CRANETILT NON-RETURN STEAM TRAPS

The Cranetilt Non-Return Trap is the most economical, simple and practical device that can be used for automatically separating condensation from steam at any temperature or pressure. It does not require any power to operate it other than the weight of the water in the tank. Lubricating oils or steam are not used as in the case of a pump. Its durability is unlimited and the necessity for repairs is practically nothing. It has the least amount of mechanism or operating parts in use on any piece of machinery built for such work. There are no interior valves, floats, buckets, levers or other working parts to give trouble or get out of order. The discharge valve is on the outside, easily accessible and simple in construction and has an area 50 per cent greater than the area of the inlet pipe. The trunnions have the full area of the pipe or inlet connection, thereby giving the trap exceptionally large discharging capacity. At all times it can be told at a glance that the trap is working, as the tank tilts at each discharge.

THIS TRAP WILL NOT DISCHARGE WATER INTO A BOILER

## RATINGS OF

# CRANETILT NON-RETURN TRAPS

### POUNDS OF WATER DISCHARGED PER HOUR WITH VARIOUS EFFECTIVE PRESSURES AT THE TRAP

The capacity of any steam trap depends on the area of the valve opening and the effective pressure available at the trap.

To determine the size of a Cranetilt Non-Return Steam Trap by the following table:

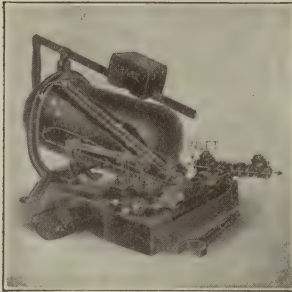
Find in the first column the pressure equal to the effective pressure at the trap; follow the horizontal line across the table to the quantity of water to be handled; the correct size and number of trap will be found at the head of the column.

Pres- sure at Trap	NUMBER OF TRAP AND SIZE OF INLET AND OUTLET								
	30— ¼-in.	32— ½-in.	33— ¾-in.	34— 1-in.	35— 1 ¼-in.	36— 1 ½-in.	37— 2-in.	38— 2 ½-in.	39— 3-in.
5	372	930	1,860	3,100	4,650	6,200	9,300	12,400	15,500
10	528	1,320	2,640	4,400	6,600	8,800	13,200	17,600	22,000
15	648	1,620	3,240	5,400	8,100	10,800	16,200	21,600	27,000
20	756	1,890	3,780	6,300	9,450	12,600	18,900	25,200	31,500
25	852	2,130	4,260	7,100	10,650	14,200	21,300	28,400	35,500
30	920	2,310	4,620	7,700	11,550	15,400	23,100	30,800	38,500
40	1,080	2,700	5,400	9,000	13,500	18,000	27,000	36,000	45,000
50	1,200	3,000	6,000	10,000	15,000	20,000	30,000	40,000	50,000
60	1,320	3,300	6,600	11,000	16,500	22,000	33,000	44,000	55,000
75	1,488	3,720	7,440	12,400	18,600	24,800	37,200	49,600	62,000
100	1,704	4,260	8,520	14,200	21,300	28,400	42,600	56,800	71,000
125	1,896	4,740	9,480	15,800	23,700	31,600	47,400	63,200	79,000
150	2,064	5,160	10,320	17,200	25,800	34,400	51,600	68,800	86,000
175	2,292	5,730	11,460	19,100	28,650	38,200	57,300	76,400	95,500
200	2,400	6,000	12,000	20,000	30,000	40,000	60,000	80,000	100,000
250	2,700	7,750	13,500	22,500	33,750	45,000	67,500	90,000	112,500

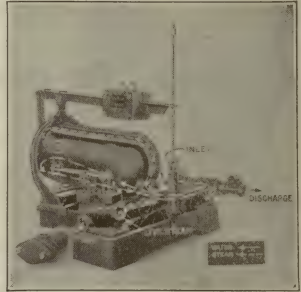
## CRANETILT STEAM TRAPS

### DIRECT RETURN

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



Nos. 90, 91, 92, 93



Nos. 94, 95, 96, 97, 98

### SERIES 90—PRICE LIST AND CAPACITIES

PIPE CONNECTIONS		Number of Trap	List Price, Including Sediment Trap, Two Swing Check Valves, Tee, Nipples and Wrench	Approximate Shipping Weight	CAPACITIES PER HOUR, BASED ON ORDINARY CONDENSING CONDITIONS.			
Size of Water Inlet and Discharge Inches	Size of Steam and Vent Valve Inches				Lineal Feet of 1 inch Pipe Trap Will Drain Feet	Pounds of Water Trap Will Discharge into Boiler Pounds	Gallons of Water Trap Will Discharge into Boiler Gallons	Square Feet of Radiation Trap Will Drain Square Feet
1/2	1/2	90	75.00	187	4,000	800	96	1,333
3/4	3/4	91	95.00	260	7,500	1,500	180	2,500
1	1	92	125.00	375	12,500	2,500	300	4,167
1 1/4	1 1/4	93	175.00	527	18,000	3,600	432	6,000
1 1/2	1 1/2	94	250.00	850	25,000	5,000	600	8,332
2	2	95	370.00	1,175	39,000	7,800	936	13,000
2 1/2	2 1/2	96	525.00	1,750	57,500	11,500	1,380	19,167
3	3	97	675.00	2,600	77,500	15,500	1,860	25,833
4	3	98	925.00	3,900	140,000	28,000	3,360	46,667

### MERITS OF CRANETILT DIRECT RETURN STEAM TRAPS

The Cranetilt Direct Return Trap will receive the water of condensation and boiler feed water from any source and automatically deliver it into a power or heating boiler at practically the temperature of the boiler due to the pressure at which the steam is condensed. In order to maintain a high efficiency in steam condensing apparatus of any description, it is important that the condensation be removed rapidly and then delivered into the boiler before it vaporizes, thereby securing pure hot water. This is the most economical, simple and practicable device that can be used for this work, as it will operate under any pressure or temperature, its durability is unlimited and the necessity for repairing infrequent. It has the smallest number of operating parts in use on any piece of machinery built for such work. There are no interior valves, floats, buckets, levers or other working parts to give trouble or get out of order. The steam and vent valves are on the outside, easily accessible and simple in construction. The trunnions have the full area of the pipe or inlet and discharge connection, thereby giving the trap exceptionally large discharging capacity. The action and working of the trap may be judged at all times, as the tank tilts at each operation.

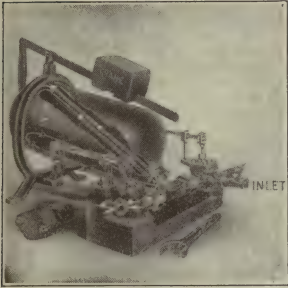
Cranetilt Direct Return Traps are the most efficient devices on the market for delivering feed water to a boiler and they will handle water of any temperature.



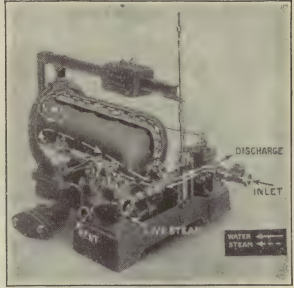
## CRANETILT STEAM TRAPS

### THREE VALVE LIFTING

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



Nos. 100, 101, 102, 103



Nos. 104, 105, 106, 107, 108

### SERIES 100—PRICE LIST AND CAPACITIES

PIPE CONNECTIONS		Number of Trap	List Price, Including Sediment Trap, Swing Check Valve, Nipple and Wrench	Approximate Shipping Weight	CAPACITIES PER HOUR, BASED ON ORDINARY CONDENSING CONDITIONS			
Size of Water Inlet and Discharge	Size of Steam and Vent Valve				Lineal Feet of 1 inch Pipe Trap Will Drain	Pounds of Water Trap Will Discharge	Gallons of Water Trap Will Discharge	Square Feet of Radiation Trap Will Drain
Inches	Inches			Pounds	Feet	Pounds	Gallons	Square Feet
1/2	1/2	100	90.00	213	4,000	800	96	1,333
3/4	3/4	101	110.00	270	7,500	1,500	180	2,500
1	1	102	145.00	395	12,500	2,500	300	4,167
1 1/4	1 1/4	103	200.00	542	18,000	3,600	432	6,000
1 1/2	1 1/2	104	300.00	875	25,000	5,000	600	8,333
2	2	105	425.00	1,275	39,000	7,800	936	13,000
2 1/2	2 1/2	106	600.00	1,800	57,500	11,500	1,380	19,167
3	3	107	775.00	2,650	77,500	15,500	1,860	25,833
4	3	108	1,075.00	4,000	140,000	28,000	3,360	46,667

### MERITS OF CRANETILT THREE VALVE TRAPS

Cranetilt Three Valve Traps are designed to be used as LIFTING, VACUUM or METERING TRAPS.

These traps are especially adapted for use on return lines handling condensation under varying pressures, especially where the pressure will vary from a vacuum to high steam pressure.

By their use the troublesome Spring Loaded Relief Valve is eliminated.

Cranetilt Three Valve Traps give excellent service on returns on apparatus that has a varying pressure while in service, such as brewing kettles, vacuum pans, evaporators, jacketed cooking kettles, heating systems and a number of other steam consuming apparatus that have a low initial starting pressure and a high terminal pressure and they will handle make up water from open type feed water heaters.

Three Valve Traps render admirable service on dry kilns using exhaust steam during the day and live steam at night, and eliminate the troubles heretofore encountered by the use of Non-Return Traps on high pressure steam, and Lifting Traps on low pressure steam, using a Weighted Swing Check Valve or Water Relief Valve. Where two traps were used before, we now use one.



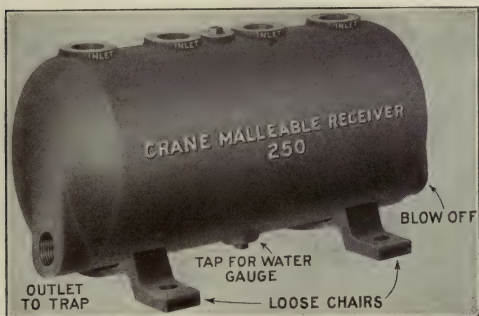


# CONDENSATION RECEIVERS

FOR USE WITH

## CRANETILT TRAPS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



Sizes  $\frac{3}{4}$  inch to  $2\frac{1}{2}$  inch, made in Malleable Iron.  
 Sizes 3 inch and 4 inch made of Riveted Steel.

Size of Receivers	List Price Complete with Loose Chairs as shown	PIPE CONNECTIONS			DIMENSIONS			Capacity Gallons	Approximate Shipping Weight Pounds
		Number of Drain Inlets	Size of Inlet and Blow-off Connections Inches	Size of Outlet Connections Inches	Extreme Length Inches	Extreme Height Inches	Outside Diameter Inches		
$\frac{3}{4}$	22.00	4	$\frac{3}{4}$	$1\frac{1}{4}$	$21\frac{1}{4}$	$11\frac{23}{32}$	$9\frac{7}{8}$	$5\frac{1}{2}$	80
1	28.00	4	1	$1\frac{1}{2}$	$26\frac{1}{4}$	$13\frac{7}{16}$	$11\frac{1}{2}$	9	120
$1\frac{1}{4}$	36.00	4	$1\frac{1}{4}$	2	30	$15\frac{1}{16}$	$13\frac{3}{8}$	$13\frac{1}{4}$	190
$1\frac{1}{2}$	50.00	4	$1\frac{1}{2}$	$2\frac{1}{2}$	34	$16\frac{1}{4}$	$14\frac{1}{8}$	18	250
2	70.00	4	2	3	39	$18\frac{9}{16}$	$16\frac{3}{8}$	28	360
$2\frac{1}{2}$	100.00	4	$2\frac{1}{2}$	$3\frac{1}{2}$	45	21	$18\frac{1}{2}$	42	550
*3	240.00	4	$2\frac{1}{2}$	4	56	$24\frac{3}{4}$	$20\frac{1}{2}$	72	525
*4	330.00	4	$2\frac{1}{2}$	5	62	$30\frac{1}{4}$	$24\frac{3}{4}$	114	825

\*Made to order only.

When more than one drain pipe is to be taken care of, a Receiver should be used, also a swing check valve in each branch draining into it.

Receivers serve the following purposes: 1st, a perfect water seal allowing only a solid body of water to flow to the Trap; 2nd, a storage reservoir of large capacity to take care of irregular volumes of condensation; 3rd, a low central point from which to drain the entire apparatus, especially where there is danger of freezing.

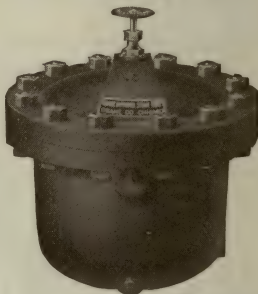
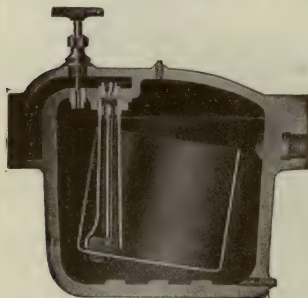
The size of Receiver is usually determined by the size of pipe connections corresponding to the water inlet of Trap.

## CRANE OPEN-FLOAT STEAM TRAPS

LOW PRESSURE—FOR STEAM PRESSURES UP TO 25 POUNDS

STANDARD—FOR STEAM PRESSURES FROM 26 TO 125 POUNDS

HIGH PRESSURE—FOR STEAM PRESSURES FROM 126 TO 200 POUNDS



Size No.	Size Inlet and Outlet Inches	Price Each	CAPACITY		Largest Outside Diameter Inches	Height Over All Inches
			Lin. Feet of One In. Pipe	Sq. Feet of Radiating Surface		
1	$\frac{3}{4}$	25.00	4000	1333	$10\frac{1}{2}$	10
2	1	35.00	6000	2000	$14\frac{3}{4}$	$14\frac{1}{4}$
3	$1\frac{1}{4}$	45.00	10,000	3333	$17\frac{1}{2}$	$16\frac{1}{4}$
4	$1\frac{1}{2}$	60.00	15,000	5000	$19\frac{1}{2}$	18

Traps wanted for  $\frac{1}{2}$  or  $\frac{3}{8}$  inch connections, we will furnish bushings for  $\frac{3}{4}$  inch (No. 1) trap without extra charge.

The capacities of these traps are based on ordinary or normal conditions, and will vary according to the service, pressure and exposure of the system to be drained.

In the inlet pipe close to the trap, we recommend the installation of one of our Sediment Traps, as shown on page 217.

### OPERATION OF TRAP

The water of condensation surrounds the float and lifts the valve to its seat. The weight of the water overflowing into the float, causes it to sink sufficiently, thereby drawing the valve away from its seat. The water is then discharged through the valve port to the outlet, by pressure in the trap. With suitable allowance for friction, they will raise water to a height of two feet for every pound pressure in the trap.

IN STARTING—THE BY-PASS VALVE SHOULD BE KEPT OPEN UNTIL THE  
SYSTEM IS RELIEVED OF AIR

WHEN ORDERING, ALWAYS SPECIFY WHETHER LOW PRES-  
SURE, STANDARD OR HIGH PRESSURE TRAPS  
ARE REQUIRED

# LOW PRESSURE COPPER EXPANSION JOINTS



FOR  
STEAM  
WORKING  
PRES-  
SURES UP  
TO 25  
POUNDS



**No. 411. HORIZONTAL OR VERTICAL  
WITH CAST IRON SWIVEL FLANGES**

**No. 412. HORIZONTAL OR VERTICAL  
WITH CAST STEEL SPLIT RINGS**

Size.....Inches	4	5	6	7	8	9
No. 411 or 412.....Each	110.00	125.00	140.00	155.00	170.00	185.00
F. to F., Flanges, No. 411....Inches	8	9	9	10	10	11
F. to F., Copper Shell, No. 412. Inches	5½	5½	6	6	6	6
Diam. Flanges and Rings...Inches	9	10	11	12½	13½	15
Thickness of Steel Ring, No. 412. Inches	¾	¾	7/16	7/16	7/16	7/16

Size.....Inches	10	12	14	15	16	18	20
No. 411 or 412.....Each	200.00	225.00	250.00	275.00	300.00	350.00	400.00
F. to F., Flanges, No. 411....Inches	11	11	12	12	12	13	13
F. to F., Copper Shell, No. 412. Inches	6	6	6	6	6	6½	6½
Diam. Flanges and Rings...Inches	16	19	21	22¼	23½	25	27½
Thickness of Steel Ring, No. 412. Inches	½	½	½	½	½	5/8	5/8

Size.....Inches	22	24	26	28	30	32	34
No. 411 or 412.....Each	450.00	500.00	600.00	650.00	725.00	800.00	875.00
F. to F., Flanges, No. 411....Inches	14	14	15	15	16	16	17
F. to F., Copper Shell, No. 412. Inches	7	7	8	8	8½	8½	8½
Diam. Flanges and Rings...Inches	29½	32	34¼	36½	38¾	41¾	43¾
Thickness of Steel Ring, No. 412. Inches	¾	¾	¾	¾	7/8	7/8	7/8

Size.....Inches	36	38	40	42	44	46	48
No. 411 or 412.....Each	950.00	1000.00	1100.00	1200.00	1300.00	1400.00	1500.00
F. to F., Flanges, No. 411....Inches	17	18	18	19	19	20	20
F. to F., Copper Shell, No. 412. Inches	8½	9	9	9	9	9	9
Diam. Flanges and Rings...Inches	46	48¾	50¾	53	55¼	57¼	59½
Thickness of Steel Ring, No. 412. Inches	1	1	1	1½	1½	1½	1¼

These Copper Expansion Joints are recommended for use only where the expansion does not exceed ¼ inch.

The flanges or rings are adjustable, thus making easy the alignment of bolt holes.

Pipe Lines containing these Expansion Joints must be anchored at suitable points, in order to force the Joints to compensate for the contraction and expansion in the piping.

**STYLE No. 412 IS ESPECIALLY RECOMMENDED ON HIGH VACUUM SYSTEMS, AS ITS CONSTRUCTION PROVIDES AGAINST DANGER OF COLLAPSING, DUE TO EXTERNAL OR ATMOSPHERIC PRESSURE.**

No. 411 is furnished faced and drilled, as shown in illustration.

No. 412 comprises the copper shell and Split Rings only, faced and drilled.

Bolts for No. 411 will be regular diameter and length corresponding to thickness of our Standard Cast Iron Flanges.

Bolts for No. 412 will be shorter, proportionate to the difference in thickness of the steel ring, as compared with the thickness of Standard Cast Iron Flanges. Templates for drilling, page 650.

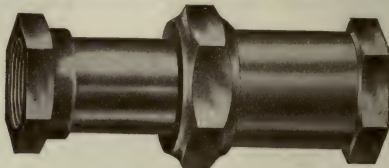
In ordering No. 411, specify whether horizontal or vertical is wanted.



## STANDARD EXPANSION JOINTS

ALL BRASS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**No. 404. SCREWED, STANDARD TRAVERSE**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Traverse.....Inches	2	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$
End to End, Open..Inches	$6\frac{3}{8}$	$7\frac{1}{4}$	$7\frac{3}{8}$	$7\frac{3}{8}$	$7\frac{3}{8}$	$8\frac{3}{8}$	$9\frac{1}{8}$	$10\frac{3}{8}$
Price.....Each	1.50	2.20	2.75	4.00	5.00	8.00	17.50	24.00

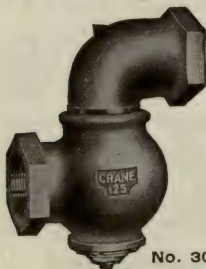
**No. 406. SCREWED, SPECIAL TRAVERSE**

Traverse	Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
4 Inches	Price.....Each	3.80	4.00	4.90	6.30	7.40	9.10	
*6 Inches	Price.....Each		8.25	9.00	10.00	11.50	13.50	24.00
8 Inches	Price.....Each		9.00	10.00	11.25	13.00	15.50	27.00
10 Inches	Price.....Each		9.75	11.00	12.50	14.50	17.50	30.00
12 Inches	Price.....Each		10.50	12.00	13.75	16.00	19.50	33.00

\*Eastern Traverse.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

For linear expansion of pipe, see page 638.



## STEAM SWING JOINTS

BRASS

FOR STEAM WORKING PRESSURES UP TO  
125 POUNDS

**No. 300**

Size.....Inches	$\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4}$	1x1	$1\frac{1}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{2}$	2x2	$2\frac{1}{2} \times 2\frac{1}{2}$	3x3
Price, Rough..Each	2.50	3.50	5.00	6.50	9.00	13.00	22.00	30.00
Price, Finished...Each	3.00	4.00	5.75	7.25	10.00	15.00	24.50	33.00

Finished Swing Joints are made to order only.



## STANDARD EXPANSION JOINTS

IRON BODY

BRASS SLEEVE

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



### No. 398. SCREWED, STANDARD TRAVERSE

Size.....Inches	2	2½	3	3½	4	4½	5
Traverse.....Inches	2½	2½	2¾	3	3¼	3½	4
End to End, Opened.....Inches	11½	12¼	13⅝	14¼	15¼	16	17¼
Price.....Each	7.00	8.00	10.00	14.00	18.00	30.00	38.00

Size.....Inches	6	7	8	9	10	12	
Traverse.....Inches	5	6	7	7	7	8	
End to End, Opened.....Inches	20⅞	23¼	26⅛	27	28	31⅞	
Price.....Each	45.00	70.00	100.00	110.00	160.00	225.00	

### No. 400. SCREWED, SPECIAL TRAVERSE

Traverse	Size..Inches	2	2½	3	3½	4	4½	5	6	7	8
* 6 in.	Price..Each	11.00	13.00	17.50	25.00	30.00	40.00	45.00	55.00		
10 in.	Price..Each	16.00	19.00	25.00	35.00	42.00	52.00	62.00	80.00	100.00	140.00
12 in.	Price..Each	18.50	22.00	29.00	40.00	48.00	60.00	70.00	92.50	115.00	160.00
14 in.	Price..Each	21.00	25.00	33.00	45.00	54.00	67.00	78.00	105.00	130.00	
16 in.	Price..Each	23.50	28.00	37.00	50.00	60.00	75.00	86.00	117.50	145.00	
18 in.	Price..Each	26.00	31.00	41.00	55.00	66.00		94.00	130.00		

\*Eastern Traverse.

No. 400 Expansion Joints, sizes 7 to 12 inch, inclusive, can be furnished with 6 inch Traverse when so ordered. Prices on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or side outlet. Prices on application.

For linear expansion of pipe, see page 638.

# STANDARD EXPANSION JOINTS

IRON BODY

BRASS SLEEVE

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



## No. 401. FLANGED, STANDARD TRAVERSE

Size.....Inches	2	2½	3	3½	4	4½	5	6
Traverse.....Inches	2½	2½	2¾	3	3¼	3½	4	5
Face to Face, Opened.....Inches	11¾	11½	12½	13½	14¼	15½	16¾	19½
Price.....Each	15.00	16.00	18.50	25.00	30.00	40.00	48.00	55.00
Diam. Flanges.....Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
Traverse.....Inches	6	7	7	7	8	10	10	10
Face to Face, Opened.....Inches	22¾	25½	26¼	27	30¾	39¼	40	41
Price.....Each	80.00	110.00	120.00	175.00	250.00	500.00	550.00	600.00
Diam. Flanges.....Inches	12½	13½	15	16	19	21	22¼	25½

## No. 403. FLANGED, SPECIAL TRAVERSE

Traverse	Size.....Inches	2	2½	3	3½	4	4½
*6 Inches	Price.....Each	18.00	20.00	25.00	35.00	40.00	50.00
10 Inches	Price.....Each	23.00	26.00	32.50	45.00	52.00	63.00
12 Inches	Price.....Each	25.50	29.00	36.50	50.00	58.00	70.00
14 Inches	Price.....Each	28.00	32.00	40.50	55.00	64.00	77.00
16 Inches	Price.....Each	30.50	35.00	44.50	60.00	70.00	85.00
18 Inches	Price.....Each	33.00	38.00	48.50	65.00	76.00	
Traverse	Size.....Inches	5	6	7	8	10	12
*6 Inches	Price.....Each	55.00	65.00				
10 Inches	Price.....Each	72.00	90.00	112.00	150.00	225.00	300.00
12 Inches	Price.....Each	80.00	102.50	127.00	170.00	255.00	350.00
14 Inches	Price.....Each	88.00	115.00	142.00	190.00	285.00	400.00
16 Inches	Price.....Each	96.00	127.50	157.00	210.00	315.00	
18 Inches	Price.....Each	104.00	140.00	172.00	230.00	350.00	

\*Eastern Traverse.

No. 403 Expansion Joints, sizes 7 to 16 inch, inclusive, can be furnished with 6 inch Traverse when so ordered. Prices on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or with side outlet. Prices on application.

For linear expansion of pipe, see page 638.

Templates for drilling, page 650. Price List for drilling, page 141.

## DOUBLE EXPANSION JOINTS

IRON BODY

BRASS SLEEVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 409

WITH ANCHORAGE SADDLE BASE AND LATERAL SERVICE BRANCH

Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 409, Flanged... Each	35.00	40.00	45.00	60.00	75.00	90.00	105.00	130.00
Traverse on Each Sleeve..Inches	4	4	4	4	4	4	4	4
Service Opening..Inches	2	2	2	2	2½	2½	3	3
End to End, Open, Screwed..Inches	28	28½	29½	30¾	31¾	32	32½	34
Face to Face, Open, Flanged..Inches	28	28½	29½	30¾	31¾	32	32½	34
Diam. of Flanges..Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
No. 409, Flanged... Each	165.00	200.00	250.00	300.00	400.00	600.00	700.00	800.00
Traverse on Each Sleeve..Inches	4	4	4	3½	3½	3½	3½	3½
Service Opening..Inches	4	4	4	4	4½	4½	5	5
End to End, Open, Screwed..Inches	36¼	37¾	39¾	39¼	43			
Face to Face, Open, Flanged..Inches	36¼	37¾	39¾	39¼	43	45	46½	48½
Diam. of Flanges..Inches	12½	13½	15	16	19	21	22¼	23½

These Expansion Joints can be furnished with screw ends when so specified, at same price.

Unless otherwise ordered, the service outlets will be made with screwed ends on expansion joints 4½ inch and smaller, and flanged ends on sizes 5 inch and larger.

The above Double Expansion Joints are made of the same general proportions as our Standard Patterns and are more particularly designed for underground work.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

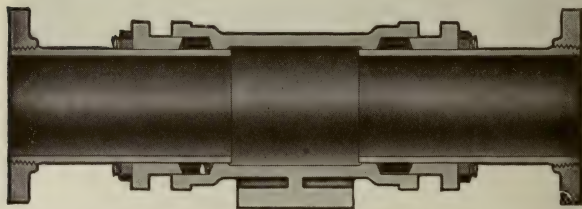
Single Standard Expansion Joints can also be furnished with Base and Lateral Service Branch. These will be made to order only. Prices on application.

## DOUBLE EXPANSION JOINTS

IRON BODY

BRASS SLEEVES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 408

WITH ANCHORAGE SADDLE BASE

Size.....Inches	2	2½	3	3½	4	4½	5	6
No. 408, Flanged...Each	32.50	37.50	42.50	55.00	70.00	85.00	100.00	120.00
Traverse on Each Sleeve..Inches	4	4	4	4	4	4	4	4
End to End, Open, Screwed..Inches	28	28½	29½	30¾	31¾	32	32½	34
Face to Face, Open, Flanged..Inches	28	28½	29½	30¾	31¾	32	32½	34
Diam. of Flanges..Inches	6	7	7½	8½	9	9¼	10	11
Size.....Inches	7	8	9	10	12	14	15	16
No. 408, Flanged...Each	155.00	190.00	240.00	290.00	390.00	575.00	675.00	775.00
Traverse on Each Sleeve..Inches	4	4	4	3½	3½	3½	3½	3½
End to End, Open, Screwed..Inches	36¼	37¾	39¾	39¼	43			
Face to Face, Open, Flanged..Inches	36¼	37¾	39¾	39¼	43	45	46½	48½
Diam. of Flanges..Inches	12½	13½	15	16	19	21	22¼	23½

These Expansion Joints can be furnished with screwed ends, when so specified, at same price.

The above Double Expansion Joints are made of the same general proportions as our Standard Patterns and are more particularly designed for underground work.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Single Standard Expansion Joints can also be furnished with Base. These will be made to order only. Prices on application.



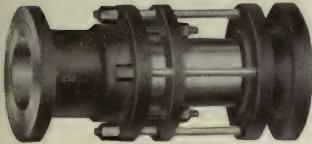
**EXTRA HEAVY EXPANSION JOINTS**

IRON BODY

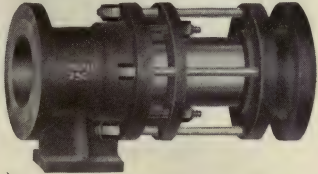
WITH TIE RODS

BRASS SLEEVE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 49 E

No. 49 E  
WITH ANCHOR BASE**STANDARD TRAVERSE**

Size.....Inches	2	2½	3	3½	4	5	6	7
No. 48 E, Screwed. Each	30.00	40.00	50.00	60.00	70.00	80.00	100.00	120.00
No. 49 E, Flanged. Each	35.00	45.00	55.00	65.00	75.00	85.00	105.00	125.00
Traverse.....Inches	2½	2½	2¾	3	3¼	4	5	6
E. to E. Screwed, Opened. .Inches	15½	15½	16½	18	18½	21½	24½	27½
F. to F. Flanged, Opened. .Inches	15½	16	17½	18½	19½	22½	25½	28½
Diam. Flanges...Inches	6½	7½	8¼	9	10	11	12½	14
Size.....Inches	8	9	10	12	14	15	16	18
No. 48 E, Screwed. Each	145.00	190.00	240.00	290.00				
No. 49 E, Flanged. Each	150.00	200.00	250.00	300.00	500.00	500.00	750.00	1000.00
Traverse.....Inches	7	7	7	8	10	10	10	10
E. to E. Screwed, Opened. .Inches	30¾	31¾	32¾	36½				
F. to F. Flanged, Opened. .Inches	31½	31½	33½	37½	43	43½	45	46½
Diam. Flanges...Inches	15	16¼	17½	20½	23	24½	25½	28

Prices of Expansion Joints with Anchor Base on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

For linear expansion of pipe, see page 638.

Templates for drilling, page 652. Price List for drilling, page 152.



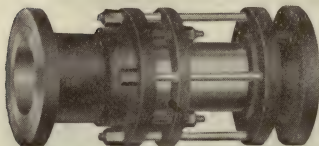
## EXTRA HEAVY EXPANSION JOINTS

IRON BODY

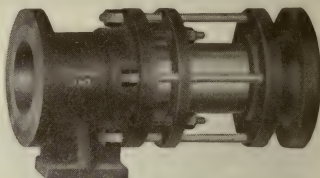
WITH TIE RODS

BRASS SLEEVE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 52 E

No. 52 E  
WITH ANCHOR BASE

### PRICE LIST—No. 50 E SCREWED—SPECIAL TRAVERSE

Traverse	Size...Inches	2	2½	3	3½	4	5	6	7	8
4 in.	No. 50 E, Serd. Each	35.00	45.00	55.00	65.00	75.00				
6 in.	No. 50 E, Serd. Each	40.00	50.00	60.00	70.00	80.00	85.00	105.00		
10 in.	No. 50 E, Serd. Each	45.00	55.00	65.00	75.00	85.00	95.00	125.00	145.00	175.00
12 in.	No. 50 E, Serd. Each	50.00	60.00	70.00	80.00	90.00	105.00	135.00	160.00	205.00
14 in.	No. 50 E, Serd. Each	55.00	65.00	75.00	85.00	95.00	115.00	145.00	175.00	235.00
16 in.	No. 50 E, Serd. Each	60.00	70.00	80.00	90.00	100.00	125.00	155.00	190.00	265.00

### PRICE LIST—No. 52 E FLANGED—SPECIAL TRAVERSE

Traverse	Size...Inches	2	2½	3	3½	4	5	6	7	8
4 in.	No. 52 E, Flgd. Each	40.00	50.00	60.00	70.00	80.00				
6 in.	No. 52 E, Flgd. Each	45.00	55.00	65.00	75.00	85.00	90.00	110.00		
10 in.	No. 52 E, Flgd. Each	50.00	60.00	70.00	80.00	90.00	100.00	130.00	150.00	180.00
12 in.	No. 52 E, Flgd. Each	55.00	65.00	75.00	85.00	95.00	110.00	140.00	165.00	210.00
14 in.	No. 52 E, Flgd. Each	60.00	70.00	80.00	90.00	100.00	120.00	150.00	180.00	240.00
16 in.	No. 52 E, Flgd. Each	65.00	75.00	85.00	95.00	105.00	130.00	160.00	195.00	270.00

Prices of Expansion Joints with Anchor Base furnished on application.

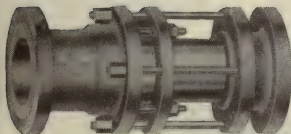
Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

Made to order with longer traverse than above, at a special price. For linear expansion of pipe, see page 638.

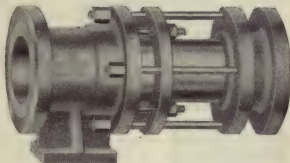
Templates for drilling, page 652. Price List for drilling, page 152.

## EXTRA HEAVY CAST STEEL EXPANSION JOINTS

WITH TIE RODS



No. 49 A STEEL



No. 49 A STEEL  
WITH ANCHOR BASE

Size.....Inches	4	5	6	8	10	12
No. 49 A, Flanged.....Each	150.00	175.00	200.00	250.00	325.00	400.00
No. 49 D, Flanged.....Each	90.00	110.00	135.00	200.00	275.00	325.00
Traverse.....Inches	3¼	4	5	7	7	8
Face to Face, Open.....Inches	19½	22⅜	25¾	31½	33⅝	37⅞
Diameter of Flanges.....Inches	10	11	12½	15	17½	20½

### GENERAL SPECIFICATIONS

Class A	350 POUNDS STEAM WORKING PRESSURE WITH TOTAL TEMPERATURE OF 800° FAHRENHEIT					
	Cast Steel Body, Spool and Gland with Body and Gland bushed with Monel Metal.					
	Sleeve—Monel Metal.					
Class D	500 POUNDS COLD WATER AND 400 POUNDS HOT WATER WORKING PRESSURE					
	Cast Steel Body, Spool and Gland.					
	Sleeve—Crane Special Brass.					

Prices of Expansion Joints with Anchor Base on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed, specify kind of packing required.

For linear expansion of pipe, see page 638.

All End Flanges are furnished with  $\frac{1}{8}$  inch raised face.

In ordering, always specify by NUMBER and LETTER denoting combination wanted.

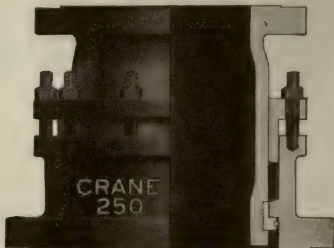
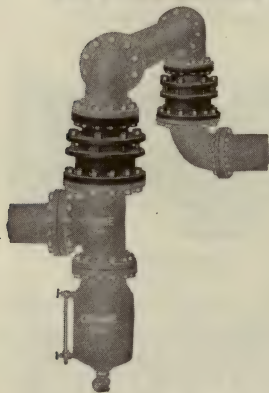
Cast Steel Expansion Joints for higher working pressures made to order.

For drilling templates, see page 652. Price List for drilling, see page 178.

**EXTRA HEAVY  
SWIVEL EXPANSION JOINTS**

**CAST IRON** **FLANGED**

**BRASS BEARINGS AND SPLIT SHOULDER RINGS  
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**ILLUSTRATING METHODS OF  
PLACING SWIVEL EXPANSION  
JOINTS IN A STEAM LINE**

**No. 51 E SWIVEL JOINT**

Size	Price Swivel Joint Only	Price for Drilling	Bolts	Face to Face	Diameter of Sleeve Flange	Diameter of Body Flange
Inches	Each	Per Joint	Per Set	Inches	Inches	Inches
3	70.00	1.25	1.35	10	8 $\frac{1}{4}$	5×11
3 $\frac{1}{2}$	80.00	1.50	1.35	10 $\frac{3}{8}$	9	5×11
4	90.00	1.75	2.00	11 $\frac{1}{8}$	10	6×12 $\frac{1}{2}$
5	105.00	2.00	2.50	12	11	7×14
6	120.00	2.50	2.95	12 $\frac{3}{4}$	12 $\frac{1}{2}$	9×16 $\frac{1}{4}$
7	140.00	2.50	4.30	13 $\frac{1}{2}$	14	10×17 $\frac{1}{2}$
8	170.00	2.50	4.30	14 $\frac{1}{2}$	15	12×20 $\frac{1}{2}$
10	250.00	4.00	5.85	16 $\frac{1}{4}$	17 $\frac{1}{2}$	14×23
12	300.00	5.00	5.85	18	20 $\frac{1}{2}$	16×25 $\frac{1}{2}$
14	500.00	6.00	7.25	20	23	18×28
16	750.00	7.50	10.55	21 $\frac{3}{4}$	25 $\frac{1}{2}$	22×33

Sizes above 16 inch, prices on application.

These Joints will be made to order of Ferroteel, at an extra price.

It will be noted that the sleeve and body Flanges are the regular Extra Heavy diameters and are drilled to the regular Extra Heavy templates. Templates for drilling, page 652.

The construction of these Joints is such that they will make an entire revolution without danger of the sleeves blowing out.

All bearing parts are faced with brass; in consequence, they will not corrode, stick nor bind.

These Joints will be furnished with stuffing box packed at an additional price which will depend upon the kind of packing required.

## STANDARD FLEXIBLE JOINTS OF THE "MORAN" TYPE



These Joints are made of the loose type and become tight when the pressure is put on.



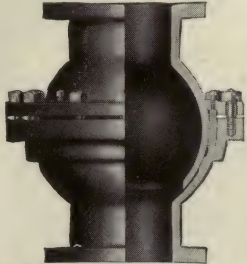
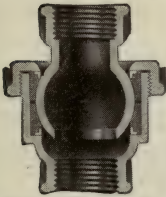
Tight Joints will be made to order at a special price.

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	3.00	3.00	3.25	3.75	4.25	5.25	6.00
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price.....Each	7.50	9.00	11.25	14.00	15.00	18.75	25.00

Both ends are female; Iron Pipe Standard Threads.

The above Joints are All Iron. Will make to order All Brass, at a special price.

## BARCO FLEXIBLE JOINTS



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Straight.....Each	6.75	7.00	7.50	8.80	9.90	12.30	14.00
Angle.....Each	7.25	7.50	8.00	9.30	10.40	12.80	14.50
Size.....Inches	2	$2\frac{1}{2}$	3	4	5	6	
Straight.....Each	17.50	21.00	26.30	35.10	43.90	58.50	
Angle.....Each	19.50	23.00	28.30	38.10	47.90	63.50	

In ordering, please specify whether brass, malleable or cast iron joints are wanted, using the following as a guide as to how they are regularly made:

**BRASS.**— $\frac{1}{4}$  inch to  $2\frac{1}{2}$  inch, both male and female ends.

**MALLEABLE.**— $\frac{1}{4}$  inch to  $2\frac{1}{2}$  inch, both male and female ends.

**MALLEABLE.**— $2\frac{1}{2}$  inch to 4 inch, female ends only, unless otherwise specified.

**CAST IRON.**—4 inch to 6 inch, female ends only, unless otherwise specified.

Standard joints are suitable for steam working pressures up to 150 pounds and extra heavy joints up to 250 pounds.

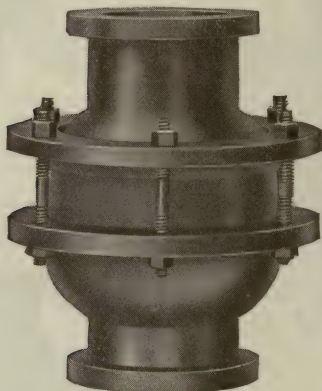
Sizes 4 inches to 36 inches will be furnished flanged at a special price.

# WALKER FLEXIBLE JOINTS

PATENTED

FOR SUBMERGED PIPE LINES

GAS SUCTION OR PRESSURE MAINS



Size Inches	Screwed Each	Flanged Each	Hub and Spigot Each	Approximate Weight Pounds
4	17.50	17.50	16.00	145
6	22.75	22.75	21.00	174
8	29.00	29.00	27.00	323
10	37.25	37.25	35.00	475
12	46.00	46.00	43.00	666
14		57.50	54.00	970
16		68.00	64.00	1140
18		79.00	74.00	1275
20		93.00	86.00	1460
24		125.00	115.00	1900

Flexible Joints are used in the laying of Submarine Pipe Lines of all kinds, but more especially where a Diver is not employed.

An excellent proof of the merits of these Joints, is the fact that they have been adopted and have given satisfaction in upwards of one hundred submarine pipe lines, under pressure of from 10 to 250 pounds.

In ordering, state whether Screwed, Flanged or Hub and Spigot ends. Drilling of Flanged Joints at an extra price, when so ordered.



## RAILING FITTINGS

### BALL PATTERN

### FINISHED BRASS

FOR OFFICE RAILING, ENCLOSING ENGINES AND MACHINERY,  
EXHIBITION SPACES, ETC.



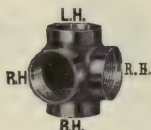
No. 1 BRASS



No. 2 BRASS



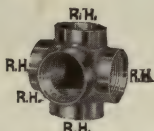
No. 3 BRASS



No. 4 BRASS



No. 5 BRASS



No. 6 BRASS



No. 7 BRASS



No. 8 BRASS

Pipe Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2
No. 1 Brass, Elbow.....Each	.40	.60	.80	1.20	1.60	2.50
No. 2 Brass, Elbow, Side Outlet... Each	.75	1.00	1.10	1.70	2.00	3.00
No. 3 Brass, Tee.....Each	.60	.85	1.10	1.70	2.00	3.00
No. 4 Brass, Tee, Side Outlet. Each	1.05	1.25	1.50	2.00	2.40	3.50
No. 5 Brass, Cross.....Each	1.05	1.25	1.50	2.00	2.40	3.50
No. 6 Brass, Cross, Side Outlet... Each	1.20	1.45	1.70	2.25	3.00	4.00
No. 7 Brass, Floor Flange, Square... Each	.75	.90	1.00	1.35	1.75	2.50
No. 8 Brass, Ball Ornament.. Each	.75	.90	1.00	1.35	1.75	2.50

Brass Railing Fittings are made to order only.

Railing Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular price. Tapped otherwise will be charged at 15 per cent. additional net. Orders for fittings to be tapped special should be accompanied by a sketch.

In ordering, specify catalogue number and size.

FOR MALLEABLE IRON RAILING FITTINGS, SEE FOLLOWING PAGES

## BRASS ROUND FLOOR FLANGES

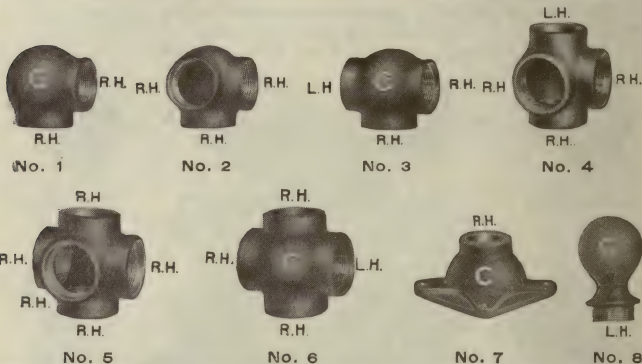


Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Price, Finished....Each	1.06	1.24	1.50	2.00	2.34	3.00	3.60

## BALL PATTERN RAILING FITTINGS

MALLEABLE IRON

FOR ALL PURPOSES



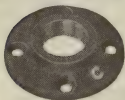
Pipe Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
No. 1, Elbow.....Each	.15	.18	.20	.35	.45	.72	1.60	2.25	4.50
No. 2, Elbow, Side Outlet..Each	.20	.23	.25	.40	.50	.80	1.75	2.50	5.00
No. 3, Tee.....Each	.20	.23	.25	.40	.50	.75	1.75	2.50	5.00
No. 4, Tee, Side Outlet....Each	.30	.33	.35	.45	.55	.90	1.90	2.60	5.25
No. 5, Cross.....Each	.30	.33	.35	.45	.58	1.00	1.80	2.60	5.25
No. 6, Cross, Side Outlet...Each	.35	.38	.40	.50	.65	1.35	2.00	2.75	5.50
No. 7, Floor Flange, Square..Each	.16	.18	.20	.40	.50	.90	1.35	2.50	5.00
No. 8, Ball Ornament.....Each	.16	.18	.20	.25	.35	.90	1.35	2.00	4.25

For Railing Fittings with Adjustable or Special Angles, see pages 294 to 297.

For Reducing Railing Fittings, see page 291.

Railing Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular price. Tapped otherwise will be charged at 15 per cent additional net. Orders for fittings to be tapped special should be accompanied by a sketch.

In ordering specify catalogue number and size.



## FLOOR FLANGES

CAST IRON

COUNTERSUNK HOLES FOR SCREWS

NOT FACED

Size.....Inches	$\frac{3}{8} \times 3$	$\frac{1}{2} \times 3\frac{1}{2}$	$\frac{3}{4} \times 3\frac{1}{2}$	$1 \times 4$	$1\frac{1}{4} \times 4$	$1\frac{1}{2} \times 4\frac{1}{2}$	$2 \times 5\frac{1}{2}$
Price.....Each	.10	.15	.15	.16	.16	.22	.35
Price, Galv..Each		.30	.30	.32	.32	.44	.70

Fittings will be Reamed for Slip Joints, when so specified, at an additional price. Inquiries and orders should be accompanied by sketches showing clearly which openings are to be so reamed.

ADD 50 PER CENT TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS

**REDUCING RAILING FITTINGS****MALLEABLE IRON****FOR ALL PURPOSES****REDUCING ELBOWS, No. 1**

Size.....Inches	$1\frac{1}{4}\times 1$	$1\frac{1}{2}\times 1\frac{1}{4}$	$2\times 1\frac{1}{4}$	$2\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2$	$3\times 2\frac{1}{2}$
Price.....Each	.40	.52	.82	.82	1.85	2.60

**REDUCING SIDE OUTLET ELBOWS, No. 2**

Size.....Inches	$1\frac{1}{4}\times 1\times 1$	$1\frac{1}{2}\times 1\frac{1}{4}\times 1\frac{1}{4}$	$2\times 1\frac{1}{4}\times 1\frac{1}{4}$
Price.....Each	.46	.58	.92
Size.....Inches	$2\times 1\frac{1}{2}\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2\times 2$	$3\times 2\frac{1}{2}\times 2\frac{1}{2}$
Price.....Each	.92	2.00	2.90

**REDUCING TEES, No. 3**

Size.....Inches	$1\times 1\times 1\frac{1}{4}$	$1\frac{1}{4}\times 1\frac{1}{4}\times 1$	$1\frac{1}{4}\times 1\frac{1}{4}\times 1\frac{1}{2}$
Price.....Each	.46	.46	.58
Size.....Inches	$1\frac{1}{2}\times 1\frac{1}{2}\times 1\frac{1}{4}$	$1\frac{1}{4}\times 1\frac{1}{4}\times 2$	$1\frac{1}{2}\times 1\frac{1}{2}\times 2$
Price.....Each	.58	.85	.85
Size.....Inches	$2\times 2\times 1\frac{1}{4}$	$2\times 2\times 1\frac{1}{2}$	$2\times 2\times 2\frac{1}{2}$
Price.....Each	.85	.85	2.00
Size.....Inches	$2\frac{1}{2}\times 2\frac{1}{2}\times 2$	$2\frac{1}{2}\times 2\frac{1}{2}\times 3$	$3\times 3\times 2\frac{1}{2}$
Price.....Each	2.00	2.90	2.90

**REDUCING SIDE OUTLET TEES, No. 4**

Size.....Inches	$1\frac{1}{4}\times 1\frac{1}{4}\times 1\times 1$	$1\frac{1}{2}\times 1\frac{1}{2}\times 1\frac{1}{4}\times 1\frac{1}{4}$	$2\times 2\times 1\frac{1}{4}\times 1\frac{1}{4}$
Price.....Each	.52	.63	1.05
Size.....Inches	$2\times 2\times 1\frac{1}{2}\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2\frac{1}{2}\times 2\times 2$	$3\times 3\times 2\frac{1}{2}\times 2\frac{1}{2}$
Price.....Each	1.05	2.20	3.00

**\*REDUCING CROSSES, No. 5**

Size.....Inches	$1\frac{1}{4}\times 1\frac{1}{4}\times 1\times 1$	$1\frac{1}{2}\times 1\frac{1}{2}\times 1\frac{1}{4}\times 1\frac{1}{4}$	$2\times 2\times 1\frac{1}{4}\times 1\frac{1}{4}$
Price.....Each	.52	.67	1.15
Size.....Inches	$2\times 2\times 1\frac{1}{2}\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2\frac{1}{2}\times 2\times 2$	$3\times 3\times 2\frac{1}{2}\times 2\frac{1}{2}$
Price.....Each	1.15	2.10	3.00

**REDUCING SIDE OUTLET CROSSES, No. 6**

Size.....Inches	$2\times 2\times 1\frac{1}{2}\times 1\frac{1}{2}\times 1\frac{1}{2}$
Price.....Each	1.55

\*Reducing Crosses are always tapped with one end of large run left hand.

ADD 50 PER CENT TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS

Reducing Fittings will always be tapped same as straight sizes, unless otherwise ordered.

## GAS FITTING PATTERN RAILING FITTINGS

### PLAIN PATTERN

### MALLEABLE IRON



R.H.

No. 61



R.H.

No. 62



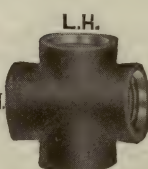
R.H.

No. 63



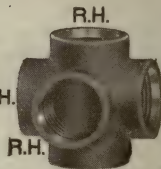
R.H.

No. 64



R.H.

No. 65



R.H.

No. 66

Pipe Size.....Inches	¾	1	1¼	1½	2	2½	3
No. 61, Elbow, Black.....Per Pound	.12	.12	.12	.12	.12	.12	.12
No. 61, Elbow, Galvanized . . . . .Per Pound	.19	.19	.19	.19	.19	.19	.19
No. 62, Elbow, Side Outlet, Black..Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 62, Elbow, Side Outlet, Galvanized ..Per Pound	.28	.28	.28	.28	.28	.28	.28
No. 63, Tee, Black.....Per Pound	.12	.12	.12	.12	.12	.12	.12
No. 63, Tee, Galvanized .....Per Pound	.19	.19	.19	.19	.19	.19	.19
No. 64, Tee, Side Outlet, Black ..Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 64, Tee, Side Outlet, Galvanized..Per Pound	.28	.28	.28	.28	.28	.28	.28
No. 65, Cross, Black.....Per Pound	.20	.20	.12	.12	.12	.12	.12
No. 65, Cross, Galvanized.....Per Pound	.28	.28	.19	.19	.19	.19	.19
No. 66, Cross, Side Outlet, Black..Per Pound	.20	.20	.20	.20	.20	.20	.20
No. 66, Cross, Side Outlet, Galvanized ..Per Pound	.28	.28	.28	.28	.28	.28	.28

Fittings larger than 2 inch are made to order only

Fittings will be furnished tapped, as shown in cuts, or Right Hand on all openings when so specified, at regular price. Tapped otherwise will be charged at 15 per cent additional, net.

Reducing sizes will be made to order at a special price, and unless otherwise specified, will be tapped same as straight Fittings, as shown in above cuts.

Fittings will be Reamed for Slip Joints, when so specified, at an additional price. Inquiries and orders should be accompanied by sketches showing clearly which openings are to be so reamed.

IN ORDERING, SPECIFY CATALOGUE NUMBER AND SIZE  
BLACK WILL ALWAYS BE FURNISHED UNLESS GALVANIZED IS SPECIFIED



## AUXILIARY RAILING FITTINGS

MALLEABLE IRON



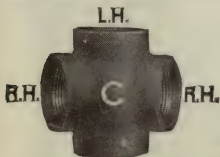
No. 9. RECESSED COUPLING



No. 10



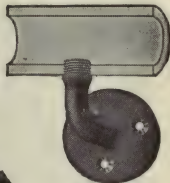
No. 11



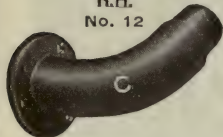
No. 12



No. 50



No. 51



No. 52



No. 56



No. 57



No. 58



No. 59



No. 60

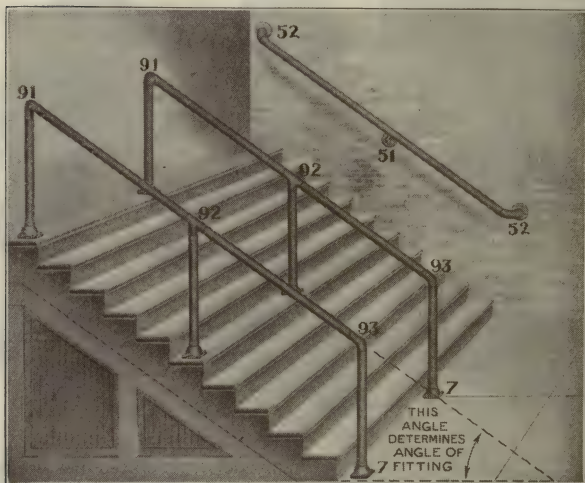
Pipe Size.....Inches	1	1¼	1½	2
No. 9, Recessed Pipe Coupling .....Each	.35	.45	.55	.70
No. 9, Recessed Pipe Coupling, Galv.....Each	.40	.55	.70	.90
No. 10, Floor Flange, Long Base .....Each	.30	.60	.75	1.25
No. 11, 45° Side Outlet Elbow.....Each	.50	.70	.90	1.50
No. 12, 45° Side Outlet Tee.....Each	.55	.75	1.00	1.60
No. 50, Stair Rail Bracket .....Each	.35	.35	.35	.35
No. 51, Stair Rail Bracket .....Each	.45	.45	.45	.45
No. 52, Stair Rail Bracket Elbow.....Each		1.10	1.30	
No. 55, Loafer Rail (Cast Iron) 18 in. long..Each	.30	.30	.30	.30
No. 56, Hitching Post Caps, Male .....Each			.35	
No. 57, Hitching Post Caps, Female.....Each			.40	.90
No. 58, Board Walk Flange.....Each	.35	.40	.50	.65
No. 59, Board Walk Bracket.....Each	.35	.40	.50	.65
No. 60, Self-Closing Gate Hinge ..... Per Set	3.00	3.00	3.75	4.75
No. 60, Self-Closing Gate Hinge, Galv.. Per Set	3.75	3.75	5.00	6.50

ADD 50 PER CENT. FOR GALVANIZED WHERE GALV. PRICES ARE NOT GIVEN.

In ordering these Fittings, describe kind wanted by number and size.



# FLUSH JOINT STAIR RAIL FITTINGS FOR SCHOOLS AND PUBLIC BUILDINGS



Size.....Inches	1¼	1½	2
No. 91, Stair Landing Elbow.....Each	2.50	2.75	3.25
No. 91, Stair Landing Elbow, Galvanized.....Each	2.80	3.15	3.75
No. 92, Center Rail Tee.....Each	2.75	3.00	3.50
No. 92, Center Rail Tee, Galvanized.....Each	3.15	3.50	4.15
No. 93, Angle Elbow.....Each	2.50	2.75	3.25
No. 93, Angle Elbow, Galvanized.....Each	2.80	3.15	3.75

Furnished in any angle between  $27\frac{1}{2}^{\circ}$  and  $47\frac{1}{2}^{\circ}$ .



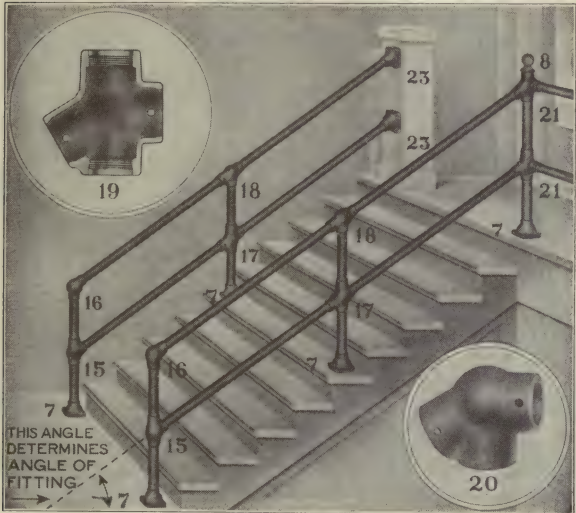
THESE FITTINGS ARE MADE WITH AN EXTENSION OR CONNECTOR, OVER WHICH THE PIPE IS TIGHTLY DRIVEN UP TO THE FACE OF FITTINGS, FORMING A SMOOTH, FLUSH JOINT.

THESE FITTINGS WILL BE FURNISHED TO ORDER ONLY.

INQUIRIES AND ORDERS SHOULD SPECIFY STYLE NUMBER, SIZE AND ANGLE, ALSO WHETHER BLACK OR GALVANIZED, MALLEABLE IRON OR FINISHED BRASS.

# SLIP AND SCREW JOINT VARIABLE ANGLE MALLEABLE IRON STAIR RAIL FITTINGS

ANGLE FITTINGS, VERTICAL JOINTS SCREWED  
ANGLE JOINTS DRILLED FOR RIVETS



These Fittings may be used on any Stair Rail between  $27\frac{1}{2}^{\circ}$  and  $47\frac{1}{2}^{\circ}$ .

30° Fittings—for angles between  $27\frac{1}{2}^{\circ}$  and  $32\frac{1}{2}^{\circ}$ .

35° Fittings—for angles between  $32\frac{1}{2}^{\circ}$  and  $37\frac{1}{2}^{\circ}$ .

40° Fittings—for angles between  $37\frac{1}{2}^{\circ}$  and  $42\frac{1}{2}^{\circ}$ .

45° Fittings—for angles between  $42\frac{1}{2}^{\circ}$  and  $47\frac{1}{2}^{\circ}$ .

When ordering, specify number and angle of fitting required.

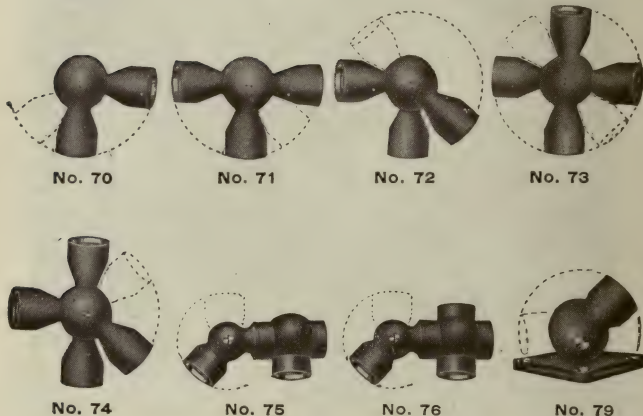
Size.....	Inches	1	1¼	1½	2
No. 15, Angle Tee.....	Each	1.30	1.50	2.00	2.50
No. 16, Angle Elbow.....	Each	1.10	1.25	1.70	2.25
No. 17, Angle Cross.....	Each	1.50	1.75	2.35	2.75
No. 18, Angle Tee.....	Each	1.30	1.50	2.00	2.50
No. 19, Single Angle Cross.....	Each	1.50	1.75	2.35	2.75
No. 20, Single Angle Tee.....	Each	1.30	1.50	2.00	2.50
No. 21, Angle Tee, Right Hand, Side Outlet.....	Each	1.85	2.20	3.00	3.60
No. 22, Angle Tee, Left Hand, Side Outlet.....	Each	1.85	2.20	3.00	3.60
No. 23, Square Post Angle Flange.....	Each	1.50	1.75	1.90	2.25

These Fittings take the place of Special Angle Fittings, have a better appearance and are stronger than the adjustable, and are time and money savers.

The Posts are first screwed together and the rails are then fitted and riveted.

## ADJUSTABLE RAILING FITTINGS

### MALLEABLE IRON



Pipe Size .....	Inches	1	1¼	1½	2
No. 70, Elbow .....	Each	1.10	1.25	1.70	2.25
No. 71, Tee .....	Each	1.30	1.50	2.00	2.50
No. 72, Stair Tee .....	Each	1.30	1.60	2.15	2.50
No. 73, Cross .....	Each	1.50	1.75	2.35	2.75
No. 74, Stair Cross .....	Each	1.50	1.85	2.50	2.75
No. 75, Stair Landing Tee .....	Each	.90	1.10	1.50	2.15
No. 76, Stair Landing Cross .....	Each	1.00	1.20	1.60	2.40
No. 79, Flange .....	Each	1.65	1.75	1.90	2.50

ADD 50 PER CENT. TO ABOVE PRICES FOR GALVANIZED RAILING FITTINGS.

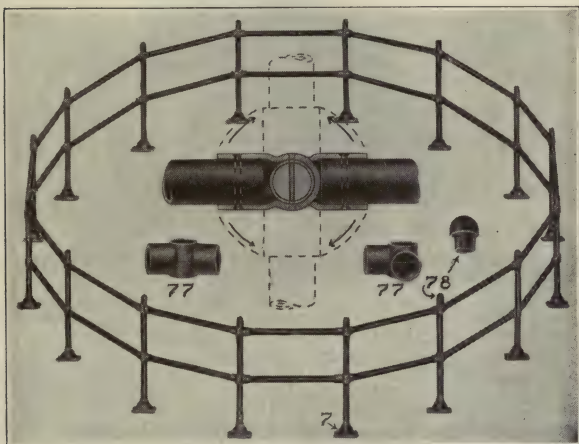
Almost any Angle required for Stair Railings may be obtained with these Fittings.

All openings will be furnished tapped Right Hand. When ordered tapped otherwise, they will be charged 15 per cent. additional net.

IN ORDERING, DESCRIBE KIND WANTED BY NUMBER AND SIZE

# ALL-SLIP ADJUSTABLE RAILING CROSS

MALLEABLE IRON



No. 77 ALL-SLIP ADJUSTABLE CROSS

No. 78 MALLEABLE CAP

No. 7 SQUARE FLOOR FLANGE, THREADED

Size.....Inches	1	1¼	1½	2
No. 77, All-Slip Cross.....Each	1.25	1.40	1.65	2.25
No. 77, All-Slip Cross, Galvanized.....Each	1.50	1.75	2.10	2.85
No. 78, All-Slip Cap.....Each	.40	.45	.50	.60
No. 78, All-Slip Cap, Galvanized.....Each	.50	.55	.65	.80

FOR PRICE OF No. 7 SQUARE FLOOR FLANGE, SEE PAGE 290

This All-Slip Adjustable Cross is so constructed that it will take any angle between a straight line and 90 degrees. This gives an adjustable horizontal swing of 180 degrees, which will make possible a rail almost circular or elliptical in form, depending upon the diameter or radius required and the number of posts used. It will thus be seen that its range of application will cover almost any horizontal angle from an approximate circle to a square.

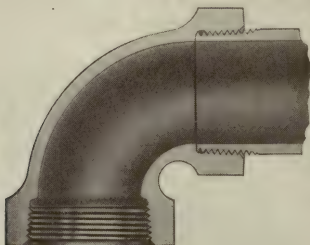
The Cross will not be furnished drilled for pins unless so specified, in which case an extra charge is made. Orders should state the size of pin holes.

The Malleable Cap is not threaded; it is constructed to be tightly driven into the pipe above the Cross.

## DRAINAGE FITTINGS

SCREWED

FOR WROUGHT PIPE



### TO THE PLUMBING TRADE:

Attention is invited to the largely increased number of sizes, and the variety of Drainage Fittings now carried in stock by us.

On June 1, 1911, a revised list on Drainage Fittings was made effective. The old list was very unequal, some of the smaller sizes being too high, while the larger sizes, as a rule, were too low.

At the present prices, the Wrought Pipe Drainage System can be installed so inexpensively that it is not much of an item, and as it is so much superior to the old method, we feel sure it will be used extensively in residences, as well as in large buildings.

These Fittings are made with a shoulder, and are the same inside diameter as wrought pipe.

The pipe screws in up to the shoulder, making a continuous passage, leaving no pockets in which solid matter can lodge, thus preventing the choking up of the pipe.

When not otherwise specified, these Fittings will be coated with heated asphaltum, excepting those for use in New York City, which will not be coated.

### GALVANIZED DRAINAGE FITTINGS

We have exceptional facilities for furnishing Galvanized Drainage Fittings promptly.

### MALLEABLE IRON DRAINAGE FITTINGS

We have furnished these Fittings made of malleable iron from regular patterns, and are prepared to fill orders in any quantity on short notice. Use same list as for Cast Iron Drainage Fittings with special discount.

### VACUUM CLEANING INSTALLATIONS

We recommend the use of our Drainage Fittings for Vacuum Cleaning installations. Fittings that are ordinarily tapped pitched for drainage work can be furnished without pitch to order.

ALL DRAINAGE FITTINGS ARE RECESSED TO ALLOW EASY ENTRANCE  
OF THE PIPE



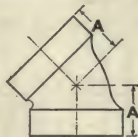
## DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE

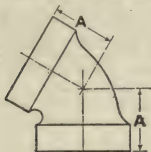
90° ELBOWS  
No. 1000

No. 1000		
Size...Ins.	1½×1¼	2×1¼
Each...	.57	.85
Galv..Ea.	1.00	1.50

45° ELBOWS  
No. 1003

Size...Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12	14
Dim. A, No. 1000, Inches	1¾	2⅜	2⅝	2⅞	3⅜	3⅞	4½	5⅜	5⅞	6½	7¾	9	9¾
Dim. A, No. 1003, Inches	1⅝	1⅞	1¾	2⅜	2⅞	3¼	3⅞	3½	3⅞	4⅜	4⅞	5½	5⅞
Price...Each	.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00	47.50	65.00
Price, Galvanized, Each	.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00	83.00	114.00

The 90° Elbows are tapped, pitched ¼ inch to the foot.

60° ELBOWS  
No. 100211¼° ELBOWS  
No. 1006

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10
Dimensions A, No. 1002, Inches	1⅞	1¾	2	2½	2⅞	3⅝	3⅞	4⅜	4½	5⅝	6¼
Dimensions A, No. 1006, Inches	1	1⅜	1⅞	1⅞	1⅞	2⅞	2⅞	2½	2⅞	2¾	3
Price.....Each	.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
Price, Galvanized...Each	.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00

22½° ELBOWS  
No. 10055° ELBOWS  
No. 1007

## 22½° ELBOWS

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12
Dimensions A, Inches	1⅞	1¾	1⅞	1¾	2	2⅞	2⅞	2⅞	3¼	3⅞	3⅞	4⅞
Price.....Each	.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00	47.50
Price, Galv...Each	.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00	83.00

## 5° ELBOWS

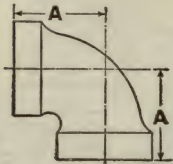
Size.....Inches	1¼	1½	2	3	4	5	6	7	8	10
Dimensions A.....Inches	1	1⅞	1½	1¾	2	2¼	2⅞	2⅞	2½	2¾
Price.....Each	.30	.38	.57	1.45	2.30	4.25	6.25	11.50	15.00	31.00
Price, Galvanized.....Each	.52	.67	1.00	2.55	4.00	7.40	11.00	20.00	26.25	54.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

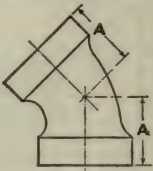
DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



90° LONG TURN ELBOWS  
No. 1001



45° LONG TURN ELBOWS  
No. 1004

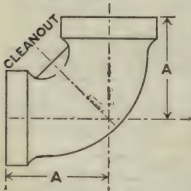
90° LONG TURN ELBOWS

Size..Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12	14
Dimensions A. In.	2¾	2½	3⅞	3⅞	4¼	5⅞	6⅞	7⅞	8⅞	9	11	13	14¼
Price..Each	.35	.42	.65	1.40	1.75	2.75	5.25	7.50	13.50	19.00	38.00	57.50	75.00
Price, Galv. Each	.60	.72	1.15	2.45	3.10	4.80	9.20	13.15	23.50	33.25	66.50	100.00	130.00

The 90° Long Turn Elbows are tapped, pitched ¼ inch to the foot.

45° LONG TURN ELBOWS

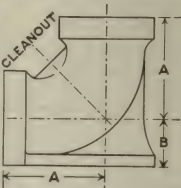
Size..Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12	14
Dimensions A. In.	1¾	1⅞	2¼	2⅝	2⅞	3⅞	4⅞	4⅞	5½	6	7½	8¾	9½
Price..Each	.35	.42	.65	1.40	1.75	2.75	5.25	7.50	13.50	19.00	38.00	57.50	75.00
Price, Galv..Each	.60	.72	1.15	2.45	3.10	4.80	9.20	13.15	23.50	33.25	66.50	100.00	130.00



No. 1047  
WITHOUT BASE

90° LONG TURN ELBOWS  
WITH CLEANOUT

Size.....Inches	4
Dimensions A..Inches	6¼
Dimensions B..Inches	2⅞
Size of Cleanout...Inches	2
No. 1047.....Each	5.00
No. 1047 Galv...Each	8.75
No. 1056.....Each	7.00
No. 1056, Galv..Each	12.25



No. 1056  
WITH BASE

STREET ELBOWS

Size.....Inches	1¼	1½	2
Dimension A...Inches	2⅝	2⅞	3⅞
Dimension B...Inches	1⅞	1⅞	2⅞
Dimension C...Inches	1⅞	2	2⅞
Dimension D...Inches	1⅞	1¼	1¾
Price.....Each	.35	.40	.60
Price, Galv.....Each	.60	.70	1.10



No. 1057  
90° STREET ELBOW



No. 1058  
45° STREET ELBOW

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

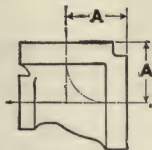
# DRAINAGE FITTINGS

## CAST IRON

## SCREWED FOR WROUGHT PIPE

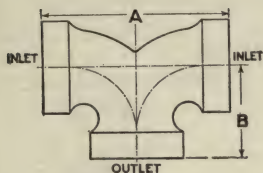


**90° ELBOWS  
WITH SIDE OUTLET  
No. 1008**

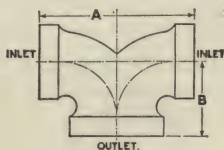


**90° ELBOWS  
WITH HEEL OUTLET  
No. 1009**

Size.....	Inches	4
Dimensions A.....	Inches	3 $\frac{13}{16}$
Size of Side Outlet.....	Inches	2
Size of Heel Outlet.....	Inches	2
Price.....	Each	3.85
Price, Galvanized.....	Each	6.75



**THREE WAY  
ELBOWS  
No. 1010**



**REDUCING THREE WAY  
ELBOWS  
No. 1011**

Size.....	Inches	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4
Dimensions A.....	Inches	4 $\frac{1}{2}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$	7 $\frac{3}{8}$	8 $\frac{5}{8}$	10 $\frac{3}{8}$
Dimensions B.....	Inches	2 $\frac{1}{4}$	2 $\frac{5}{8}$	3 $\frac{1}{8}$	3 $\frac{11}{16}$	4 $\frac{5}{16}$	5 $\frac{3}{16}$
Price.....	Each	.75	.85	1.10	2.25	3.00	5.00
Price, Galvanized.....	Each	1.25	1.50	1.95	3.90	5.25	8.75
Size.....	Inches	4×3	5	5×4	6	6×4	6×5
Dimensions A.....	Inches	9 $\frac{1}{2}$	12 $\frac{1}{4}$	11 $\frac{3}{8}$	14 $\frac{1}{4}$	12 $\frac{3}{8}$	13 $\frac{3}{8}$
Dimensions B.....	Inches	4 $\frac{5}{16}$	6 $\frac{1}{8}$	5 $\frac{5}{16}$	7 $\frac{1}{8}$	5 $\frac{7}{16}$	6 $\frac{1}{4}$
Price.....	Each	5.50	7.50	8.25	13.50	15.00	15.00
Price, Galvanized.....	Each	9.65	13.15	14.50	23.50	26.25	26.25

The inlets of Three Way Elbows are tapped, pitched  $\frac{1}{4}$  inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.

**DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE**

## DRAINAGE FITTINGS

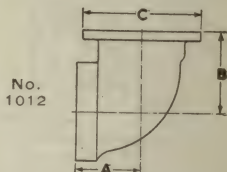
CAST IRON

SCREWED FOR WROUGHT PIPE

### CLOSET ELBOWS

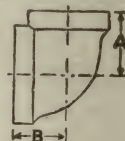
FLANGED ONE END

Size.....	Inches	4
Dimension A.....	Inches	$3\frac{1}{16}$
Dimension B.....	Inches	$4\frac{5}{8}$
Diameter of Flange C.....	Inches	7
Price.....	Each	4.25
Price, Galvanized.....	Each	7.40

No.  
1012

### REDUCING CLOSET ELBOWS

Size.....	Inches	4×5
Dimension A.....	Inches	$4\frac{7}{16}$
Dimension B.....	Inches	$3\frac{1}{16}$
Price.....	Each	4.25
Price, Galvanized.....	Each	7.40

No.  
1013

Closet Elbows are tapped pitched  $\frac{1}{4}$  inch to the foot.

### CLOSET FLANGES

FOR FLAT GASKET

No. 1014 MALL. IRON  
No. 1014½ BRASS

FOR RING GASKET



No. 1015½ BRASS

FOR FLAT GASKET



No. 1015 BRASS

FOR RING GASKET

No. 1016 MALL. IRON  
No. 1016½ BRASS

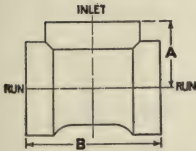
Size.....	Inches	4
Diameter of Flange.....	Inches	7
Price, Nos. 1014, 1016, Malleable Iron.....	Each	1.35
Price, Nos. 1014, 1016, Malleable Iron, Galvanized.....	Each	2.35
Price, Nos. 1014½, 1015, 1015½, 1016½, Brass.....	Each	7.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE.

# DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



## TEES

No. 1017

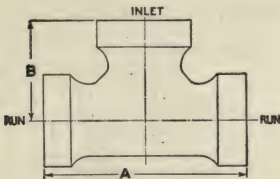
Size.... Inches	1¼	1½	1½×1¼	2	2×1¼	2×1½	2½	2½×2	3	3×1½
Dimension A. Inches	1¾	2 <sup>3</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>16</sub>		2¼	2 <sup>11</sup> / <sub>16</sub>		3 <sup>3</sup> / <sub>16</sub>	
Dimension B. Inches	3½	4 <sup>3</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>		4½	5 <sup>5</sup> / <sub>8</sub>		6 <sup>3</sup> / <sub>8</sub>	
Price.... Each	.45	.55	.60	.80	.90	.90	1.50	1.65	2.00	2.20
Price, Galv... Each	.80	1.00	1.10	1.40	1.60	1.60	2.50	2.75	3.50	3.85

Size.... Inches	3×2	4	4×2	4×3	5	5×2	5×3	5×4	6	7
Dimension A. Inches	3	4	3 <sup>3</sup> / <sub>16</sub>	3¾	4 <sup>5</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>		5 <sup>3</sup> / <sub>16</sub>	5 <sup>11</sup> / <sub>16</sub>
Dimension B. Inches	5½	8	6	7	9¼	6	6 <sup>7</sup> / <sub>8</sub>		10 <sup>3</sup> / <sub>8</sub>	11 <sup>5</sup> / <sub>8</sub>
Price.... Each	2.20	3.25	3.60	3.60	6.00	6.60	6.60	6.60	8.75	16.00
Price, Galv... Each	3.85	5.70	6.30	6.30	10.50	11.55	11.55	11.55	15.25	28.00

Size.... Inches	8	10	12	12×8	12×10	14×8	14×10	14×12		
Dimension A. Inches	6½	7¾	9							
Dimension B. Inches	13	15½	18							
Price.... Each	21.00	43.00	60.00	65.00	65.00	85.00	85.00	85.00		
Price, Galv... Each	37.00	75.00	100.00	110.00	110.00	145.00	145.00	145.00		



## Basin Tees

No. 1018

Size..... Inches	1¼	1½	1½×1¼	2	2×1¼	2×1½	2½
Dimension A..... Inches	4 <sup>5</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5½	7	6¼	6½	8½
Dimension B..... Inches	2 <sup>5</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>	3½	3 <sup>1</sup> / <sub>8</sub>	3¼	4¼
Price..... Each	.60	.70	.77	1.10	1.20	1.20	1.75
Price, Galvanized..... Each	1.00	1.22	1.35	1.95	2.10	2.10	3.00

The inlets of Tees and Basin Tees are tapped, pitched ¼ inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.

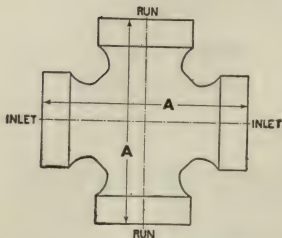
**DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE**



# DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE

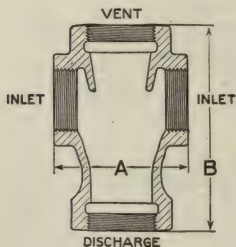


## BASIN CROSSES

No. 1019

Size.....	Inches	1¼	1½	2	2×1½
Dimensions A.....	Inches	4⅝	5⅜	7	6½
Price.....	Each	1.25	1.50	1.75	1.95
Price, Galvanized.....	Each	2.25	2.50	3.10	3.40

The inlets of Basin Crosses are tapped, pitched ¼ inch to the foot.



## PARTITION CROSSES

No. 1046

Size.....	Inches	1¼×1½
Dimension A.....	Inches	3½
Dimension B.....	Inches	5½
Price.....	Each	1.25
Price, Galvanized.....	Each	2.20

Partition Crosses have been made to supply a demand in certain localities, but may not be passed by inspectors everywhere.

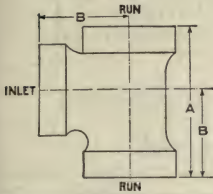
The inlets on Reducing Fittings are always the smallest openings.

**DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE**

**DRAINAGE FITTINGS**

CAST IRON

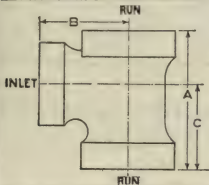
SCREWED FOR WROUGHT PIPE

**90° Y BRANCHES**

No. 1020

TEE PATTERN

Size.....Inches	1	1¼	1½	2	2½	3	4	5	6	7	8	10
Dimension A.....Inches	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	20
Dimensions B.....Inches	1½	2¼	2½	3½	3½	4¼	5½	6½	7½	8½	9	11¾
Price.....Each	.40	.45	.57	.85	1.80	2.20	3.50	6.50	9.50	17.50	23.00	47.00
Price, Galv. . . . .Each	.70	.80	1.00	1.50	3.15	3.85	6.15	11.35	16.50	30.50	40.00	82.00

**REDUCING 90° Y BRANCHES**

No. 1021

TEE PATTERN

Size.....Inches	1¼×1	1½×1	1½×1½	2×1¼	2×1½	2½×1½	2½×1½	2½×2
Dimension A.....Inches			¾		¾		¾	½
Dimension B....Inches			2½		2½		3½	3½
Dimension C...Inches			2¾		2½		2½	¾
Price.....Each	.50	.63	.63	.95	.95	2.00	2.00	2.00
Price, Galvanized..Each	.90	1.10	1.10	1.65	1.65	3.50	3.50	3.50
Size.....Inches	3×1¼	3×1½	3×2	4×1¼	4×1½	4×2	4×2½	4×3
Dimension A.....Inches		5½	5½		5¼	5½	6½	7¾
Dimension B....Inches		3½	3½		3½	4½	4½	4¾
Dimension C....Inches		2½	3½		3	3¾	3½	4½
Price.....Each	2.40	2.40	2.40	3.85	3.85	3.85	3.85	3.85
Price, Galvanized..Each	4.20	4.20	4.20	6.75	6.75	6.75	6.75	6.75
Size.....Inches	3×4	5×1½	5×2	5×2½	5×3	5×4	6×1½	6×2
Dimension A.....Inches	8½	5½	6½		7¾	9½		6¼
Dimension B....Inches	5½	4¾	4¾		5¼	5½		5½
Dimension C....Inches	5½	3½	3½		4½	5¾		3¾
Price.....Each	3.85	7.15	7.15	7.15	7.15	7.15	10.50	10.50
Price, Galvanized..Each	6.75	12.50	12.50	12.50	12.50	12.50	18.50	18.50
Size.....Inches	6×3	6×4	6×5	8×2	8×3	8×4	8×5	8×6
Dimension A.....Inches	7¾	9¼	10½		11¾	11¾		15½
Dimension B....Inches	5¾	6½	6½		7¼	7½		8½
Dimension C....Inches	4½	5½	6¼		7½	7½		10
Price.....Each	10.50	10.50	10.50	25.50	25.50	25.50	25.50	25.50
Price, Galvanized..Each	18.50	18.50	18.50	44.50	44.50	44.50	44.50	44.50

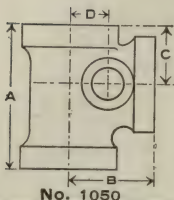
The inlet of 90° Y Branches is tapped, pitched ¼ inch to the foot.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

## DRAINAGE FITTINGS

**CAST IRON**

**SCREWED FOR WROUGHT PIPE**



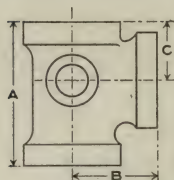
**No. 1050**

### 90° Y BRANCHES WITH VENTS

(CLOSET TEES)

Size.....	Inches	4
Dimension A.....	Inches	8 $\frac{3}{4}$
Dimension B.....	Inches	5 $\frac{3}{16}$
Dimension C.....	Inches	3 $\frac{9}{16}$
Dimension D.....	Inches	2 $\frac{5}{16}$

No. 1050, with 2 inch Vent on Branch, on Right Side.....	Each	5.75
No. 1050, with 2 inch Vent on Branch, on Right Side, Galv....	Each	10.00
No. 1051, with 2 inch Vent on Branch, on Left Side.....	Each	5.75
No. 1051, with 2 inch Vent on Branch, on Left Side, Galv....	Each	10.00



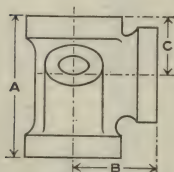
**No. 1052**

### 90° Y BRANCHES WITH AUXILIARY INLETS

(CLOSET TEES)

Size.....	Inches	4
Dimension A.....	Inches	8 $\frac{3}{4}$
Dimension B.....	Inches	5 $\frac{3}{16}$
Dimension C.....	Inches	3 $\frac{9}{16}$

No. 1052, with 2 inch Inlet on Body, on Right Side.....	Each	5.75
No. 1052, with 2 inch Inlet on Body, on Right Side, Galv....	Each	10.00
No. 1053, with 2 inch Inlet on Body, on Left Side.....	Each	5.75
No. 1053, with 2 inch Inlet on Body, on Left Side Galv....	Each	10.00



**No. 1054**

### 90° Y BRANCHES WITH AUXILIARY INLETS

(CLOSET TEES)

Size.....	Inches	4
Dimension A.....	Inches	8 $\frac{3}{4}$
Dimension B.....	Inches	5 $\frac{3}{16}$
Dimension C.....	Inches	3 $\frac{9}{16}$

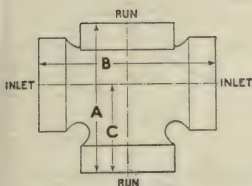
No. 1054, with 2 inch 45° Inlet on Body, on Right Side.....	Each	6.35
No. 1054, with 2 inch 45° Inlet on Body, on Right Side, Galv. Each		11.00
No. 1055, with 2 inch 45° Inlet on Body, on Left Side.....	Each	6.35
No. 1055, with 2 inch 45° Inlet on Body, on Left Side, Galv....	Each	11.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE.  
ABOVE CUTS SHOW RIGHT HAND INLETS

## DRAINAGE FITTINGS

CAST IRON

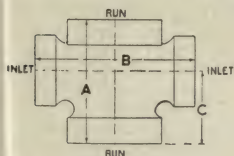
SCREWED FOR WROUGHT PIPE

DOUBLE  
90° Y BRANCHES

No. 1024

TEE PATTERN

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	10
Dimension A.....Inches	3 1/4	3 3/4	4 1/4	5 5/8	6 5/8	7 1/4	8 3/4	10 5/8	11 5/8	13 5/8	15 1/8	20
Dimension B.....Inches	3 7/8	4 1/2	5	6 1/8	7 3/8	8 1/2	10 3/8	12 1/4	14 1/4	16 1/4	18	22 3/4
Dimension C.....Inches	1 1/8	2 1/4	2 1/2	3 1/8	3 1/8	4 1/4	5 3/8	6 1/8	7 1/8	8 1/8	9	11 3/8
Price.....Each	.60	.70	.85	1.30	2.85	3.40	5.25	9.50	14.00	25.00	36.00	60.00
Price, Galv... Each	1.05	1.22	1.50	2.30	5.00	5.95	9.20	16.50	24.50	42.50	62.00	102.00

DOUBLE REDUCING  
90° Y BRANCHES

No. 1025

TEE PATTERN

Size.....Inches	1 1/4 x 1	1 1/2 x 1 1/4	2 x 1 1/4	2 x 1 1/2	2 1/2 x 1 1/2	2 1/2 x 2	3 x 1 1/2
Dimension A.....Inches		3 7/8		4 5/8		5 1/2	5 1/8
Dimension B.....Inches		5		5 7/8		6 5/8	6 5/8
Dimension C.....Inches		2 3/8		2 11/16		3 1/4	2 11/16
Price.....Each	.77	.95	1.50	1.50	3.15	3.15	3.75
Price, Galvanized.....Each	1.35	1.65	2.60	2.60	5.50	5.50	6.55
Size.....Inches	3 x 2	4 x 2	5 x 4	6 x 2	6 x 4	6 x 5	8 x 6
Dimension A.....Inches	5 1/8	5 1/8	9 1/8	6 1/4	9 1/4	10 3/8	15 1/8
Dimension B.....Inches	7 1/4	8 1/8	11 3/8	10 1/4	12 3/8	13 1/4	17
Dimension C.....Inches	3 5/16	3 3/8	5 3/8	3 5/8	5 7/8	6 1/4	10
Price.....Each	3.75	5.75	10.50	15.50	15.50	15.50	40.00
Price, Galvanized.....Each	6.55	10.00	18.50	27.00	27.00	27.00	68.00

The inlets of Double 90° Y Branches are tapped, pitched 1/4 inch to the foot.

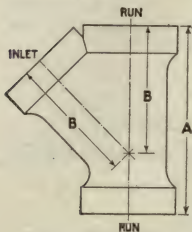
The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

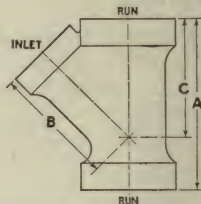
# DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



**45° Y BRANCHES**  
**No. 1028**



**REDUCING 45° Y BRANCHES**  
**No. 1029**

## 45° Y BRANCHES

Size . . . Inches	1¼	1½	2	2½	3	4	5	6	7	8	10	12	14
Dim. A . . . Inches	5	5½	6 7/16	7 7/8	.9	10 7/8	12 11/16	14 3/4	16 11/16	18 11/16	20	24 1/4	28
Dim. B . . . Inches	3 1/4	3 5/8	4 5/16	5 3/8	6 3/16	7 11/16	9 3/16	10 3/4	12 1/4	13 9/16	16 1/8	19 5/8	21 1/2
Price . . . . . Ea.	.52	.65	.95	2.10	2.65	3.85	7.10	10.50	19.00	25.00	52.00	75.00	95.00
Price, Galv. Ea.	.90	1.15	1.65	3.70	4.65	6.75	12.50	18.50	33.25	44.00	91.00	130.00	165.00

## REDUCING 45° Y BRANCHES

Size . . . Inches	1½x1¼	2x1¼	2x1½	2½x1½	2½x1¼	2½x2	3x1¼	3x1½	3x2	3x2½
Dimension A . . . Inches			5 7/8			6 7/8	7 1/8		6 5/8	7 3/8
Dimension B . . . Inches			4 1/8			4 5/8	5 1/8		5 1/8	5 11/8
Dimension C . . . Inches			4 1/16			4 9/16	4 11/16		4 11/16	5 1/16
Price . . . Each	.72	1.05	1.05	2.30	2.30	2.30	2.90	2.90	2.90	2.90
Price, Galv. . . Each	1.25	1.85	1.85	4.00	4.00	4.00	5.10	5.10	5.10	5.10

Size . . . Inches	4x1¼	4x1½	4x2	4x2½	4x3	5x2	5x3	5x4	6x2	6x2½
Dimension A . . . Inches		7 3/16	7 11/16		9 1/4	8 1/4	9 11/16	11 3/8	8 7/8	
Dimension B . . . Inches		6 1/16	6 5/16		7 3/16	7 3/16	7 7/8	8 1/2	8 1/16	
Dimension C . . . Inches		5 3/4	6		6 7/8	6 7/8	7 5/8	8 7/16	7 9/16	
Price . . . Each	4.25	4.25	4.25	4.25	4.25	7.80	7.80	7.80	11.50	11.50
Price, Galv. . . Each	7.40	7.40	7.40	7.40	7.40	13.65	13.65	13.65	20.00	20.00

Size . . . Inches	6x3	6x4	6x5	7x3	7x4	7x5	7x6	8x3	8x4	8x5
Dimension A . . . Inches	10	11 7/8	13	10	11 7/8	16 11/16	16 11/16		11 7/8	
Dimension B . . . Inches	8 3/4	9 3/8	10	9 5/8	10 1/4	10 11/16	11 9/16		11	
Dimension C . . . Inches	8 5/16	9 1/16	9 11/16	8 7/8	9 11/16	10 1/2	11 3/8		10 7/16	
Price . . . Each	11.50	11.50	11.50	21.00	21.00	21.00	21.00	27.50	27.50	27.50
Price, Galv. . . Each	20.00	20.00	20.00	37.00	37.00	37.00	37.00	48.00	48.00	48.00

Size . . . Inches	8x6	10x4	10x5	10x6	12x6	14x3	14x4	14x5	14x6	14x12
Dimension A . . . Inches	14 11/16	14		15 1/2	18				19 1/2	
Dimension B . . . Inches	12 3/8	12 7/8		14 1/4	15 3/4				17 3/4	
Dimension C . . . Inches	11 7/8	11 1/2		13 1/2	14 1/4				16 3/8	
Price . . . Each	27.50	57.00	57.00	57.00	80.00	105.00	105.00	105.00	105.00	105.00
Price, Galv. . . Each	48.00	97.00	97.00	97.00	140.00	175.00	175.00	175.00	175.00	175.00

The inlets on Reducing Fittings are always the smallest openings.

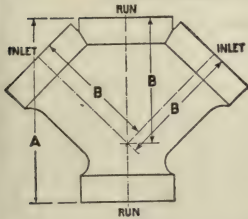
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE



## DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE

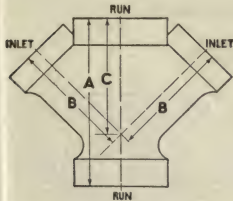


45°

## DOUBLE Y BRANCHES

No. 1030

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8	10
Dimension A....Inches	5	5½	6 <sup>7</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	9	10 <sup>7</sup> / <sub>8</sub>	12 <sup>15</sup> / <sub>16</sub>	14 <sup>3</sup> / <sub>4</sub>	16 <sup>11</sup> / <sub>16</sub>	18 <sup>13</sup> / <sub>16</sub>	20
Dimensions B...Inches	3 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	10 <sup>3</sup> / <sub>4</sub>	12 <sup>1</sup> / <sub>4</sub>	13 <sup>9</sup> / <sub>16</sub>	16 <sup>1</sup> / <sub>8</sub>
Price.....Each	.90	1.00	1.45	3.25	4.00	5.75	10.75	16.00	28.50	38.00	78.00
Price, Galv.Each	1.60	1.75	2.55	5.70	7.00	10.00	18.80	28.00	50.00	66.50	137.00



REDUCING 45°

## DOUBLE Y BRANCHES

No. 1031

Size.....Inches	1½×1¼	2×1½	2½×1¼	2½×1½	3×1½	3×2	4×2	4×3	5×2
Dimension A.....Inches		5 <sup>7</sup> / <sub>8</sub>		6 <sup>7</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>8</sub>	7 <sup>11</sup> / <sub>16</sub>	9¼	8¼
Dimensions B....Inches		4 <sup>1</sup> / <sub>8</sub>		4 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>
Dimension C.....Inches		4 <sup>1</sup> / <sub>16</sub>		4 <sup>9</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	6	6 <sup>7</sup> / <sub>8</sub>	6 <sup>7</sup> / <sub>8</sub>
Price.....Each	1.10	1.60	3.60	3.60	4.40	4.40	6.35	6.35	11.75
Price, Galv.. Each	1.90	2.80	6.30	6.30	7.70	7.70	11.00	11.00	20.50
Size.....Inches	5×3	5×4	6×2	6×3	6×4	7×6	8×4	8×6	
Dimension A.....Inches	9 <sup>1</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	8 <sup>7</sup> / <sub>16</sub>		11 <sup>7</sup> / <sub>8</sub>		11 <sup>7</sup> / <sub>16</sub>	14 <sup>15</sup> / <sub>16</sub>	
Dimensions B....Inches	7 <sup>1</sup> / <sub>8</sub>	8½	8 <sup>1</sup> / <sub>16</sub>		9 <sup>3</sup> / <sub>8</sub>		11	12 <sup>3</sup> / <sub>8</sub>	
Dimension C.....Inches	7 <sup>5</sup> / <sub>8</sub>	8 <sup>7</sup> / <sub>16</sub>	7 <sup>9</sup> / <sub>16</sub>		9 <sup>1</sup> / <sub>16</sub>		10 <sup>7</sup> / <sub>16</sub>	11 <sup>7</sup> / <sub>8</sub>	
Price.....Each	11.75	11.75	17.50	17.50	17.50	31.50	42.00	42.00	
Price, Galv.. Each	20.50	20.50	30.50	30.50	30.50	54.00	72.00	72.00	

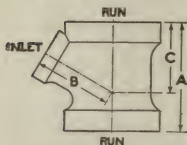
The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

## DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



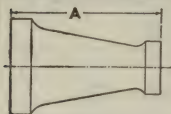
## 60° Y BRANCHES

No. 1032

Size.....Inches	1½×1½	2×2	2×1½	3×2	4×4	4×2	4×3	5×5	5×2
Dimension A...Inches	4⅝	5½	4⅞	6⅞	9⅜	6⅞		11⅞	
Dimension B...Inches	2⅝	3¼	3⅞	4⅞	5¾	4¾		6¾	
Dimension C...Inches	2⅝	3¼	2⅞	3⅞	5¾	4⅝		6¾	
Price.....Each	.65	.95	1.05	2.90	3.85	4.25	4.25	7.10	7.80
Price, Galvanized..Each	1.15	1.65	1.85	5.10	6.75	7.40	7.40	12.50	13.65

Size.....Inches	5×3	5×4	6×6	6×2	6×4	6×5	8×4	8×6	
Dimension A...Inches	8½		13						
Dimension B...Inches	6		7⅞						
Dimension C...Inches	5⅞		7⅞						
Price.....Each	7.80	7.80	10.50	11.50	11.50	11.50	27.50	27.50	
Price, Galvanized..Each	13.65	13.65	18.50	20.00	20.00	20.00	48.00	48.00	



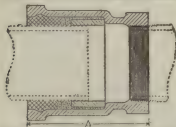
## INCREASERS

No. 1033

Size.....Inches	3×2	4×2	4×3	5×2	5×3	5×4	6×4	6×5
Dimension A...Inches	9	9	9	9	9	9	9	9
Price.....Each	2.50	3.75	3.75	5.50	5.50	5.50	6.50	6.50
Price, Galvanized..Each	4.40	6.55	6.55	9.65	9.65	9.65	11.35	11.35

Size.....Inches	7×4	7×6	8×4	8×6	10×8	12×10	14×6	14×8
Dimension A...Inches			9	9				
Price.....Each	12.00	12.00	15.00	15.00	20.00	40.00	55.00	55.00
Price, Galvanized..Each	20.00	20.00	26.25	26.25	35.00	70.00	95.00	95.00



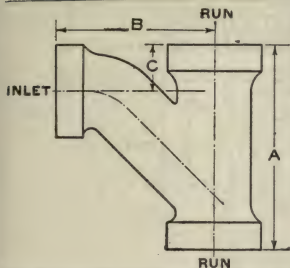
## TUCKER CONNECTIONS

No. 1048

Size.....Inches	2	3	4	5	6	8
Dimension A...Inches	4½	4¾	7	7	7	7
Price.....Each	.80	2.00	3.25	6.00	8.75	21.00
Price, Galvanized..Each	1.40	3.50	5.70	10.50	15.25	37.00

The inlets on Reducing Fittings are always the smallest openings.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

**DRAINAGE FITTINGS**

CAST IRON

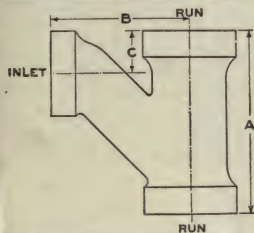
SCREWED FOR WROUGHT PIPE

**90° LONG TURN  
Y BRANCHES**

No. 1022

TEE PATTERN

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8
Dimension A ..Inches	4¾	5⅜	7⅛	8¼	9⅓	13¾	15¾	18⅛	21⅝	24⅞
Dimension B ..Inches	3⅝	4⅛	5⅞	6¼	7½	9⅞	12¼	14⅞	16⅞	19⅞
Dimension C ..Inches	1⅜	1¼	1⅝	2	2⅝	2⅞	3½	4⅛	4¾	5¼
Price.....Each	.57	.70	1.10	2.40	3.35	6.00	9.50	20.00	30.00	40.00
Price, Galv....Each	1.00	1.22	1.95	4.20	5.85	10.50	16.50	35.00	52.50	70.00

**REDUCING 90° LONG  
TURN Y BRANCHES**

No. 1023

TEE PATTERN

Size...Inches	1½×1	1½×1	1½×1½	2×1	2×1½	2½×1	2½×1½	2½×1½	2½×1½	2½×2	3×1½	3×2
Dimension A .Inches	4¼	4½	5⅞			5¾			5¾	7⅞	5½	7⅞
Dimension B .Inches	3½	3⅝	3⅞			4⅞			4⅞	5¾	5	6⅞
Dimension C .Inches	1	1	1⅞			1⅞			1⅞	1⅞	1⅞	1⅞
Price...Each	.63	.80	.80	1.20	1.20	1.20	2.65	2.65	2.65	2.65	3.75	3.75
Price, Galv...Each	1.10	1.40	1.40	2.10	2.10	2.10	4.65	4.65	4.65	4.65	6.55	6.55

Size...Inches	3×2½	4×1½	4×2	4×2½	4×3	5×1½	5×2	5×2½	5×3	5×4	6×2
Dimension A .Inches		6⅞	7⅞	8⅞	10	6⅞	7¾		10¼	13	7½
Dimension B .Inches		5⅞	6⅞	7⅞	8⅞	6	7⅞		8⅞	10⅞	7¾
Dimension C .Inches		1⅞	1⅞	2	2⅞	1⅞	1⅞		2⅞	2⅞	1⅞
Price...Each	3.75	6.60	6.60	6.60	6.60	10.50	10.50	10.50	10.50	10.50	22.00
Price, Galv...Each	6.55	11.55	11.55	11.55	11.55	18.50	18.50	18.50	18.50	18.50	38.50

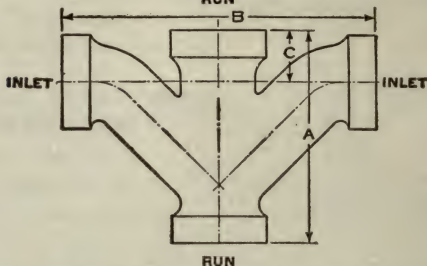
Size...Inches	6×3	6×4	6×5	7×3	7×4	7×5	7×6	8×3	8×4	10×4	12×5
Dimension A .Inches	10⅞	13⅞	16⅞	10⅞	13⅞			10⅞	13⅞	14	17
Dimension B .Inches	9⅞	11	12⅞	9⅞	11⅞			10¼	12	13	15½
Dimension C .Inches	2⅞	2⅞	3½	2⅞	2⅞			2⅞	2⅞	3	4
Price...Each	22.00	22.00	22.00	33.00	33.00	33.00	33.00	44.00	44.00	60.00	85.00
Price, Galv...Each	38.50	38.50	38.50	58.00	58.00	58.00	58.00	77.00	77.00	102.00	150.00

The inlet of 90° Long Turn Y Branches is tapped, pitched ¼ inch to the foot.  
The inlets on Reducing Fittings are always the smallest openings.

**DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE**

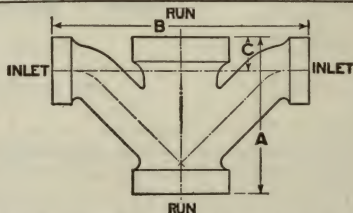
**DRAINAGE FITTINGS**

CAST IRON

SCREWED FOR WROUGHT PIPE  
RUN**DOUBLE 90° LONG TURN Y BRANCHES**

No. 1026. TEE PATTERN

Size.....Inches	1¼	1½	2	2½	3	4	5	6	7	8
Dimension A...Inches	4¾	5⅜	7⅞	8¾	9⅞	13¾	15¾	18⅞	21⅝	24⅞
Dimension B...Inches	7¼	8¼	10⅞	12½	15	19¾	24½	29⅞	33¾	38⅝
Dimension C...Inches	1⅜	1¼	1⅝	2	2⅝	2⅞	3½	4⅞	4¾	5¼
Price.....Each	1.00	1.10	1.75	3.60	5.00	9.00	14.00	30.00	45.00	60.00
Price, Galv.....Each	1.75	1.95	3.10	6.30	8.75	15.75	24.50	52.50	79.00	105.00

**DOUBLE REDUCING 90° LONG TURN Y BRANCHES**

No. 1027. TEE PATTERN

Size.....Inches	1¼×1	1½×1	1¾×1¼	2×1¼	2×1½	2½×1¼	2½×1½	3×1½
Dimension A....Inches	4¼	4½	5⅞		5¾		5¾	5⅞
Dimension B....Inches	7	7¼	7¾		8¾		9⅞	10
Dimension C....Inches	1	1	1⅜		1⅝		1⅝	1⅝
Price.....Each	1.10	1.25	1.25	1.90	1.90	4.00	4.00	5.50
Price, Galvanized..Each	1.90	2.25	2.25	3.35	3.35	7.00	7.00	9.65
Size.....Inches	3×2	4×2	4×3	5×4	6×2	6×4	6×5	
Dimension A....Inches	7⅞	7⅞	10	13	7⅞	13⅞	16⅞	
Dimension B....Inches	12⅞	13¼	16⅞	20⅞	15½	22	25⅞	
Dimension C....Inches	1⅞	1⅞	2⅞	2⅞	1⅞	2⅞	3½	
Price.....Each	5.50	10.00	10.00	15.50	33.00	33.00	33.00	
Price, Galvanized..Each	9.65	17.50	17.50	27.00	58.00	58.00	58.00	

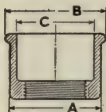
The inlets of Double 90° Long Turn Y Branches are tapped, pitched ¼ inch to the foot.

The inlets on Reducing Fittings are always the smallest openings.  
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

## DRAINAGE FITTINGS

CAST IRON

SCREWED FOR WROUGHT PIPE



## HUB CONNECTIONS

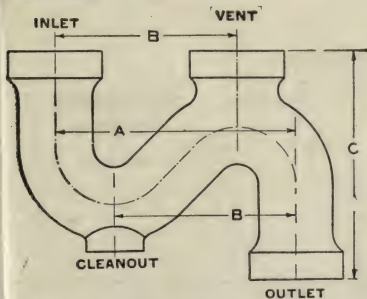
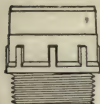
No. 1034

Size.....Inches	2	3	4	5	6
Dimension A.....Inches	3½	4⅞	5⅝	6⅞	7¾
Dimension B.....Inches	3⅞	4⅞	6	7⅞	8⅞
Dimension C.....Inches	3	4⅛	5⅛	6	7⅛
Price.....Each	1.15	1.20	1.50	2.00	4.25
Price, Galvanized.....Each	2.00	2.10	2.60	3.50	7.40

## BRASS SOLDERING NIPPLES

No. 1035

Size ...Inches	1	1¼	1½	2	3	4	5
Price ...Each	.80	.90	1.05	1.50	2.75	4.00	9.00



## S TRAPS

No. 1036

Size.....Inches	2	3	4	5	6
Dimension A.....Inches	8¼	10¾	14⅞	16¾	20¼
Dimensions B.....Inches	6¼	8⅞	10⅝	12⅞	15⅞
Dimension C.....Inches	8	11¼	13¾	16⅞	19¾
Size of Cleanout.....Inches	1	1¼	2	2	2
Size of Vents.....Inches	2	3	4	4	4
Price.....Each	4.00	9.25	14.00	21.00	36.00
Price, Galvanized.....Each	7.00	16.00	24.00	37.00	63.00

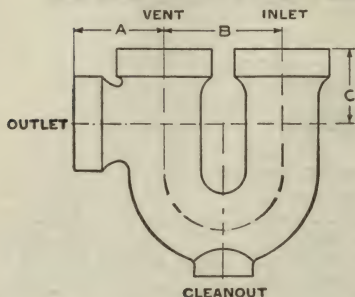
DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE



## DRAINAGE FITTINGS

CAST IRON

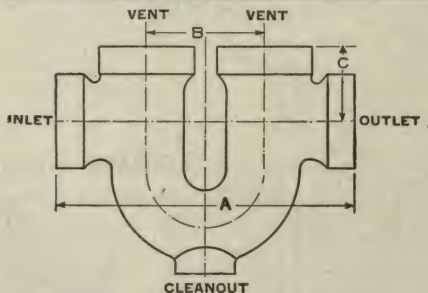
SCREWED FOR WROUGHT PIPE



### HALF S TRAPS

No. 1037

Size.....Inches	1¼	1½	2	3	4	5	6	7	8
Dimension A.....Inches	2 <sup>5</sup> / <sub>16</sub>	2½	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	5½	6 <sup>1</sup> / <sub>16</sub>	6 <sup>9</sup> / <sub>16</sub>	7¾	8 <sup>13</sup> / <sub>16</sub>
Dimension B.....Inches	3 <sup>1</sup> / <sub>8</sub>	3¾	4	5¾	7	8¾	10 <sup>1</sup> / <sub>8</sub>	11¼	12¾
Dimension C.....Inches	2	2¼	2 <sup>9</sup> / <sub>16</sub>	3½	4 <sup>3</sup> / <sub>16</sub>	4¾	5 <sup>7</sup> / <sub>16</sub>	6½	6¾
Size of Vent.....Inches	1¼	1½	2	3	4	4	4	5	6
Size of Cleanout....Inches	¾	1	1	1¼	2	2	2	2	3
Price.....Each	1.55	1.70	2.20	5.00	10.00	21.50	32.50	40.00	55.00
Price, Galvanized....Each	2.70	3.00	3.85	8.75	17.50	37.50	57.00	70.00	95.00



### RUNNING TRAPS

No. 1038

Size ...Inches	1¼	1½	2	3	4	5	6	7	8	10	12	14
Dim. A ..Inches	7¾	8¾	10 <sup>1</sup> / <sub>8</sub>	13¾	17¼	20½	23¾	26¾	30¼	36¼	41 <sup>7</sup> / <sub>8</sub>	45
Dim. B ..Inches	3 <sup>1</sup> / <sub>8</sub>	3¾	4	5¾	7	8¾	10 <sup>1</sup> / <sub>8</sub>	11¼	12¾	14¾	17	18½
Dim. C ..Inches	2	2¼	2 <sup>9</sup> / <sub>16</sub>	3½	4 <sup>3</sup> / <sub>16</sub>	4¾	5 <sup>7</sup> / <sub>16</sub>	6½	6¾	8¾	9½	10½
Size of Vents In.	1¼	1½	2	3	4	4	4	5	6	6	6	8
Size Cleanout In.	¾	1	1	1¼	2	2	2	2	3	3	3	4
Price ... Each	2.40	2.70	3.30	5.50	9.75	24.50	33.50	50.00	65.00	115.00	180.00	300.00
Price, Galv. Each	4.20	4.70	5.75	9.50	17.00	43.00	58.50	87.50	115.00	200.00	300.00	500.00

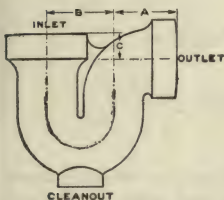
The outlet of Half S Traps and inlet and outlet of Running Traps are tapped, pitched ¼ inch to the foot.

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

**DRAINAGE FITTINGS**

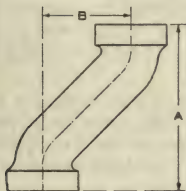
CAST IRON

SCREWED FOR WROUGHT PIPE

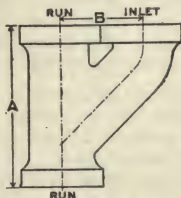
**P TRAPS**

No. 1059

Size.....Inches	1¼	1½	2
Dimension A.....Inches	1½	2½	2½
Dimension B.....Inches	2	2¼	2¾
Dimension C.....Inches	¾	⅞	⅞
Size of Cleanout .Inches	¾	1	1
Black.....Each	1.45	1.55	2.00
Galvanized.....Each	2.55	2.70	3.50

**OFFSETS**

No. 1039

**SPECIAL  
UPRIGHT Y BRANCHES**

No. 1049

**OFFSETS**

Size...Inches	2	2	2	2	3	3	3	3	4	4	4
Offset B..Inches	4	6	8	10	4	6	8	10	4	6	8
Length A.Inches	7½	9½	11½	13½	8¾	10¾	12¾	14¾	9¾	11¾	13¾
Price...Each	2.15	2.40	2.60	2.85	3.35	4.00	4.75	5.50	5.00	5.75	6.50
Price Galv...Each	3.75	4.20	4.55	5.00	5.85	7.00	8.30	9.65	8.75	10.00	11.35

Size...Inches	4	4	5	5	5	5	6	6	6	6	
Offset B..Inches	10	12	6	8	10	12	6	8	10	12	
Length A.Inches	15¾	17¾	12½	14½	16½	18½	13½	15½	17½	19½	
Price...Each	7.50	8.50	9.00	10.00	11.00	12.00	12.50	13.50	14.50	15.50	
Price, Galv...Each	13.15	15.00	15.75	17.50	19.25	21.00	22.00	23.50	25.50	27.00	

**SPECIAL UPRIGHT Y BRANCHES**

Size.....Inches	2×1½	2½×1½	2½×2	3×2	3×3	4×2	4×4
Dimension A.....Inches	5⅞	5½	7⅞	9½	9½	7⅞	11¾
Dimension B.....Inches	2½	3½	3½	4½	4½	4½	5½
Price.....Each	2.90	4.50	4.50	6.00	5.50	8.75	8.00
Price, Galvanized.....Each	5.10	7.75	7.75	10.50	9.75	15.25	14.00

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE

## A NEW LINE

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# DRAINAGE FITTINGS

FOR

# WALL CLOSETS

The new line of drainage "Y's" illustrated on the following pages has been designed for use wherever back or wall outlet closets are installed in batteries. They are especially adaptable for buildings of reinforced concrete construction. Using these fittings in connection with wall hung closets eliminates the necessity of cutting and thus weakening the floors, as the HORIZONTAL WASTE LINE IS ENTIRELY ABOVE THE FLOOR.

Before the advent of these fittings it has always been necessary to suspend the horizontal waste line of a battery of closets from the ceiling below, unless a groove was made in the floor or the floor of the toilet room raised. All of these methods are objectionable but are necessary where ordinary drainage fittings are used.

As will be seen from the illustrations, these fittings are tapped for the closet connection at different distances from the center of the run, so that when the closets in a battery are set in line and the fittings placed in consecutive order according to the tapping numbers given them, the waste line is given a pitch.

Each fitting takes the place of a drainage tee, nipple and "Y" required where regular fittings are used, reducing the number of joints for each closet and simplifying the piping.

The regular tapping shown in the dimension tables will take care of batteries up to twelve closets.

For sanitary reasons, the long turn fittings should be used wherever possible, and will be sent on orders unless the short turn is specified.

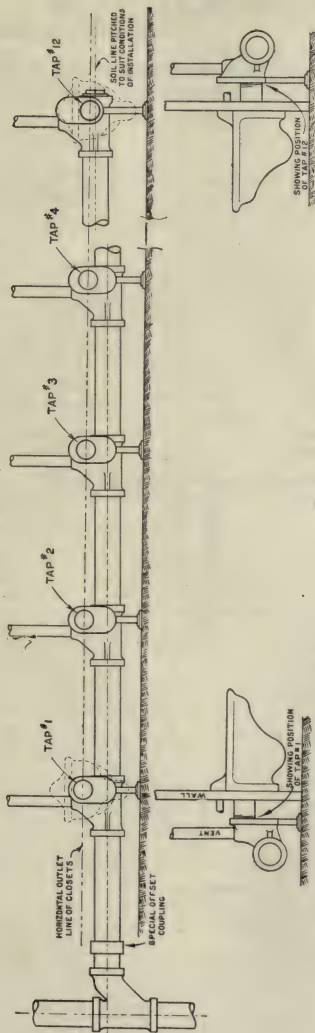
The long turn fittings are made in the 4×4 and 4×5 inch sizes, either right or left hand and single or double.

The short turn fittings are made for use where the utility corridors are narrow and are also furnished in the 4×4 and 4×5 inch sizes, right or left hand, but in single pattern only.

When ordering, give catalogue number, size, tapping number, and, if single fitting, whether right or left hand.

Standing with back to the stack, the side the closet connection is on, determines if fitting is right or left hand.

# GENERAL ARRANGEMENT, SHOWING AN INSTALLATION OF A BATTERY OF CLOSETS



The fitting with the highest tapping position should always be installed next to the soil stack. This fitting is marked No. 1. The second one from the stack is No. 2, and so on. The fitting with the lowest tapping position is No. 12. The different tapping positions are  $\frac{3}{8}$  inch from center to center.

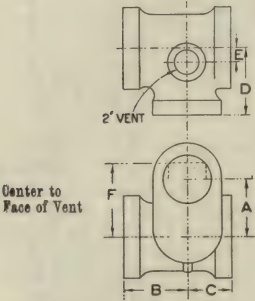
To get all closet seats the same distance from the floor level, also to take care of the pitch, of the soil line, we provide a special pitched coupling which should preferably be used next to the stack. By turning this coupling, proper installation of the closet combinations is readily made possible.

DRAINAGE FITTINGS

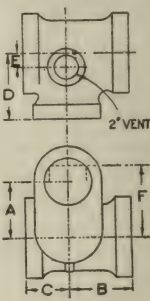
CAST IRON

SCREWED FOR WROUGHT PIPE

SHORT TURN Y FOR BATTERY OF CLOSETS  
(PATENTED)



No. 1066  
RIGHT HAND



No. 1068  
LEFT HAND

TAPPINGS AND DIMENSIONS

4X4							5X4						
Tap- ping No.	A In.	B In.	C In.	D In.	E In.	F Center to Face of Vent In.	Tap- ping No.	A In.	B In.	C In.	D In.	E In.	F Center to Face of Vent In.
1	25/8	51/4	31/2	51/4	0	3	1	47/8	53/8	33/4	53/4	11/4	61/4
2	21/4	51/4	31/2	51/4	0	3	2	41/2	53/8	33/4	53/4	11/4	61/4
3	17/8	51/4	31/2	51/4	0	3	3	41/8	53/8	33/4	53/4	11/4	61/4
4	11/2	51/4	31/2	51/4	0	3	4	33/4	53/8	33/4	53/4	11/4	61/4
5	11/8	51/4	31/2	51/4	0	3	5	33/8	53/8	33/4	53/4	11/4	61/4
6	3/4	51/4	31/2	51/4	0	3	6	3	53/8	33/4	53/4	11/4	61/4
							7	25/8	53/8	33/4	53/4	11/4	61/4
							8	21/4	53/8	33/4	53/4	11/4	61/4
							9	17/8	53/8	33/4	53/4	11/4	61/4
							10	11/2	53/8	33/4	53/4	11/4	61/4
							11	11/8	53/8	33/4	53/4	11/4	61/4
							12	3/4	53/8	33/4	53/4	11/4	61/4

PRICES

Size	Inches	4X4	4X5
No. 1066, R. H.	Each	17.00	20.00
No. 1066, R. H. Galvanized	Each	22.00	26.50
No. 1068, L. H.	Each	17.00	20.00
No. 1068, L. H. Galvanized	Each	22.00	26.50

DIMENSIONS SUBJECT TO A SLIGHT VARIATION AND CHANGE WITHOUT NOTICE



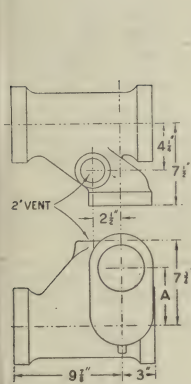
DRAINAGE FITTINGS

CAST IRON

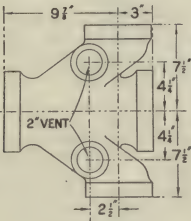
SCREWED FOR WROUGHT PIPE

LONG TURN Y FOR BATTERY OF CLOSETS

(PATENTED)



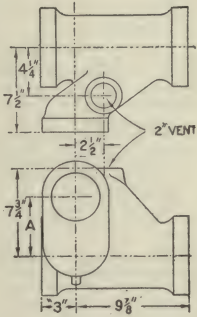
No. 1060  
RIGHT HAND



No. 1064  
DOUBLE



No. 1069  
OFFSET  
COUPLING



No. 1062  
LEFT HAND

TAPPINGS

4" X 4" and 5" X 4"	
Tapping No.	Dimension A
1	5 1/4
2	4 7/8
3	4 1/2
4	4 1/8
5	3 3/4
6	3 3/8
7	3
8	2 5/8
9	2 1/4
10	1 7/8
11	1 1/2
12	1 1/4

PRICES

Size	Inches	4 X 4	5 X 4
No. 1060, R. H.	Each	20.00	22.50
No. 1060, R. H. Galvanized	Each	26.50	31.00
No. 1062, L. H.	Each	20.00	22.50
No. 1062, L. H. Galvanized	Each	26.50	31.00
No. 1064, Double	Each	28.00	31.00
No. 1064, Double Galvanized	Each	38.00	41.00

PRICES OF COUPLINGS

Size	Inches	4	5
No. 1069, Coupling	Each	2.30	4.25
No. 1069, Coupling, Galvanized	Each	4.00	7.40
B—Length	Inches	2 3/8	2 3/4

## MAKING TIGHT SCREWED JOINTS FOR VERY HIGH PRESSURES

BY R. T. CRANE

We are in doubt if the trade clearly understands the conditions that are necessary in order to make good screw joints with pipe and fittings, especially when they are intended to withstand very high pressure, and in any event we think it might be best to put this matter before you once more.

It has been our experience that the ordinary steamfitter, when called upon to put up piping that will be subjected to a pressure of 200 or 300 pounds of steam, feels that he is shouldering a very heavy responsibility; but should he be called upon to make joints that would have to bear 1,000 pounds of air pressure, he might not feel like assuming the responsibility at all; or, should he undertake the work, probably he would feel certain that it would be necessary to resort to extraordinary means to get the desired result. In all probability he would decide that with the ordinary material manufactured and supplied to the general market, such work under these conditions was impossible.

We have demonstrated beyond the possibility of a doubt, that tight joints for 1,000 pounds air may be made with the ordinary line pipe, providing clean cut threads are made, and extraordinary care and intelligence are exercised in putting them together.

The secret of making a tight joint is to avoid or overcome the friction incident to screwing pipe and fittings together.

This friction is due to the large amount of bearing surface, especially when there is grit in the threads and the joints are coming up close to the bearing. Friction produces heat, and heat produces expansion, and as the pipe is lighter than the coupling or fitting, it expands more; then when both become cold the pipe contracts more than the coupling, thus causing a tendency to leak.

Some years ago we ran across an instance where a pipe line was being put together in the field by machinery. The machine would do the work quickly, and the workmen concluded that they had tight joints, when the joints became hot; but after the material was cold, and the heat of the friction was gone, the joints would not be tight. The fact of the matter was that the heat showed conclusively that the threads had not been properly cleaned, and instead of the heat being an evidence of a tight joint, it was evidence of a bad joint, and we have no doubt that there has been, and still is, an enormous amount of pipe line work being botched up in this way.

Some time ago we took occasion to make a test on this question on an eight-inch pipe line to withstand 1,000 pounds of air pressure; and this we did with the regular weight of line pipe and a coupling weighing about 24 pounds—the weight of a first-class line pipe coupling of this size. The result of the experiment on thirty-two joints was that on the first test all were tight excepting one, and when this joint was taken apart and again made up, it also proved tight.

These cases simply prove that it is a comparatively easy matter to make tight joints for 1,000 pounds air pressure, and with the ordinary pipe line material.

It must be evident to any one who has given any thought whatever to this subject, that in order to make good joints, the iron must be brought together as solidly as possible.

To secure this result the first essential is that the threads should be absolutely clean; and the next is that the very best lubricant should be used in order to prevent friction, and they should not be screwed up fast enough to make any change in the temperature of the material.

It is necessary that the threads be cut clean, that is, that taps and dies be in perfect condition.

A taper thread is not absolutely necessary to the making of a tight joint. (In one experiment we made one joint with coupling which had no taper at all, and the others but very little.) Nor is a large amount of bearing necessary to make a tight joint—although for permanency and serviceability the standard length of threads and taper we consider necessary and correct.

We made one joint with a thread reduced to three-eighths of an inch in length and it was tight at 1,500 pounds hydraulic pressure, thus proving that the length of thread is not essential to prevent the stripping of the thread, either from the pipe or from the coupling.

We are satisfied that especially long threads are a detriment to the making of a good joint; for it must stand to reason, that the longer the thread the more the tendency to friction, which prevents the iron from coming up close together, not to mention the natural irregularities in the threads acting in the same direction.

This will be better understood if we go to an extreme in the matter. For instance, should we undertake to make a joint on eight inch pipe, with a thread six inches long, the friction and irregularities would be so great that it would be practically impossible to get the requisite thread contact.

It should be understood that absence of heat in pipe or coupling does not mean absence of grit or gum in the threads. Dirty threads may be screwed up very slowly, and thus avoid the heating due to friction, and yet the joint be anything but tight.

## DEFECTS IN THREADS ON WROUGHT IRON OR STEEL PIPE AND FITTINGS

BY R. T. CRANE

It is surprising what erroneous ideas are held regarding the placing of too much importance on defects in threads of pipe and fittings, by those whose business it is to make joints with them.

In order to show how mistaken are these ideas, Crane Co. some time ago made the most searching and conclusive tests, giving abundant evidence that the many defects for which pipe and fittings often are rejected, are entirely unimportant and do not in the slightest, militate against the making of a thoroughly tight and serviceable joint.

One of the causes assigned for the rejection of pipe and material is that the threads are a trifle broken. Probably not so much as one per cent. of the whole bearing of the thread is gone, or marred, yet there are steamfitters who will throw out such material.

Crane Co. has shown conclusively, in the following practical way, that it is absurd to discard such material for ordinary defects in threads.

A piece of eight inch pipe was threaded for a distance of two and a quarter inches. This pipe was then put in a lathe and was mutilated, as shown in the accompanying illustration.

In the threaded part three grooves were turned, each  $\frac{3}{16}$  of an inch wide and to the bottom of the thread. The top of the remaining threads, with the exception of the one at the end of the pipe, were turned off, giving them a flat surface  $\frac{1}{32}$  of an inch wide.

Next, at three places on the circumference of the tapered thread, flat spots were filed, one inch wide and two inches long, extending one inch on the threaded part.

Twenty-five grooves were then filed in the thread of the pipe and the same number in the coupling, all parallel with the pipe and two-thirds of the depth of the thread.

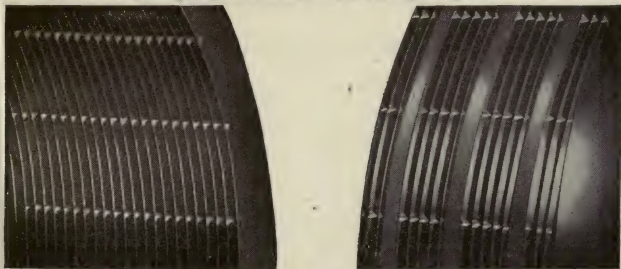
When all this deliberate mutilating was finished, the threads were cleaned thoroughly and coated with "Crane Cement." The joint was then screwed up so that the lengthwise grooves did not come opposite one another.

The outer ends of the pipe and coupling next were plugged and the joint was tested to 425 pounds of air pressure. The joint was found to be tight, and the same result followed a hydraulic pressure test of 1000 pounds.

The amount of defect in the thread of this joint was at least one hundred times greater than that for which many regular steamfitters and engineers reject material.

These tests show the amount of ignorance there has been in these matters all these years. Crane Co. reasoned this subject out, and, confident the public held a wrong theory, caused this experiment to be made.

Undoubtedly the amount of material rejected for minor and wholly unimportant defects in the past, must have cost the trade many thousands of dollars.



NOTE.—The lubricant used when making the foregoing tests was "Crane Cement." We have used this preparation for nearly forty years, and have not found anything quite so satisfactory for this purpose.

It is economical, because the saving in time and annoyance more than balances the small first cost.

### AMERICAN BRIGGS STANDARD GAUGE

THE THREADS IN ALL OUR VALVES AND FITTINGS UP TO AND INCLUDING 12 INCH, ARE TAPPED TO AMERICAN BRIGGS STANDARD GAUGE, WHICH HAS ALSO BEEN ADOPTED AS THE UNIVERSAL STANDARD BY ALL THE LEADING WROUGHT PIPE, VALVES AND FITTINGS MANUFACTURERS IN THE UNITED STATES.

OUR CUSTOMERS MAY DEPEND UPON IT, THAT ALL OUR THREADS WILL CONFORM PERFECTLY TO THE AMERICAN BRIGGS STANDARD GAUGE AS ABOVE MENTIONED, AND SHOULD ANY DEVIATIONS DEVELOP, THE FAULT WILL UNDOUBTEDLY BE FOUND DUE TO COMPARISON WITH OTHER THREADS WHICH DO NOT CONFORM TO THIS GAUGE.

## CRANE CEMENT FOR MAKING TIGHT PIPE JOINTS

**PUT UP IN ONE, FIVE, TEN AND TWENTY POUND  
CANS, MIXED AND READY FOR USE**

**ONE POUND CANS FURNISHED IN CASES CONTAINING 24 CANS**



**LIST PRICE, 25 CENTS PER POUND**

Crane Cement, now so thoroughly well known to the steam fitting trade, has been constantly and exclusively used by us in our business for nearly thirty years, and from our personal experience, we know it to be superior to Red or White Lead, and much more economical, being double in bulk.

Crane Cement has the merits to produce less friction, and joints can be made more solid with it than with any other make of cement.

We had occasion to make joints tight in an eight inch pipe line, so that they would stand 1,000 pounds air pressure. This we accomplished with the regular weight of line pipe and extra heavy couplings.

Making absolutely tight joints at such pressure, is convincing proof of the superiority of this article

The principle involved is to make tight joints, iron to iron, and, as stated before, Crane Cement has these merits. We therefore recommend it to the trade, knowing that it will accomplish satisfactory work.

**CRANE CEMENT WILL ALWAYS BE FURNISHED IN ONE  
POUND CANS, UNLESS OTHERWISE ORDERED**

**FOR MERITS OF CRANE CEMENT, SEE PRECEDING PAGES**



## BRASS STEAM FITTINGS

IRON PIPE SIZE

ROUGH

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows.....Each	.12	.15	.20	.28	.40	.63	.90	1.20	2.00	3.50	6.00	8.00	10.00
Elbows, Reducing..Each		.19	.25	.35	.50	.80	1.10	1.50	2.50	4.25	7.50	10.00	12.50
Elbows, 45°..Each	.16	.20	.25	.31	.40	.63	.90	1.20	2.00	3.50	6.00		10.00
Elbows, Street....Each	.25	.27	.33	.48	.63	.85	1.50	2.00	3.25				
Elbows, Drop, Female..Each			.35	.45	.65	1.05	1.50	2.00	3.40				
Elbows, Side Outlet..Each			.60	.85	1.20	1.90	2.75	3.60	6.00	10.50	18.00		
Tees.....Each	.17	.21	.28	.40	.55	.85	1.25	1.70	2.80	5.00	8.50	11.00	14.00
Tees, Reducing...Each		.25	.35	.50	.70	1.05	1.55	2.10	3.50	6.25	10.50	14.00	17.50
Tees, Drop, Female..Each			.43	.57	.80	1.25							
Tees, 4-Way..Each				1.20	1.65	2.50	3.75	5.00	8.50				
Crosses.....Each	.25	.30	.40	.55	.80	1.25	1.80	2.40	4.00	7.00	12.00	16.00	20.00
Crosses, Reducing..Each		.38	.50	.70	1.00	1.55	2.25	3.00	5.00	8.75	15.00	20.00	25.00
Bushings...Each		.10	.12	.15	.22	.35	.50	.70	1.00	1.50	2.50	3.75	5.00
Faced Bushings...Each		.12	.15	.19	.27	.44	.62	.87	1.25	1.85	3.10	4.75	6.25
Plugs.....Each	.08	.10	.12	.15	.20	.30	.45	.60	.95	1.50	2.25	3.75	5.00
Solid Plugs..Each			.18	.22	.30	.45	.80	1.20	1.90	3.00	4.50	7.50	10.00
Countersunk Plugs..Each				.22	.30	.45	.65	.90	1.40				
Caps.....Each	.10	.13	.16	.20	.30	.42	.60	.80	1.25	2.50	3.50	5.50	7.00
Lock-nuts...Each	.10	.10	.12	.15	.20	.28	.40	.55	.80	1.75	2.75	4.00	5.00
Reducers...Each		.15	.20	.28	.40	.60	.90	1.10	1.75	2.75	4.00	6.00	8.00
Couplings...Each	.10	.13	.17	.25	.37	.55	.80	1.00	1.60	2.50	3.50	5.25	7.00
Couplings, R. & L..Each		.17	.22	.30	.45	.70	1.00	1.30	2.00	3.10	4.50		
Return Bends, Close..Each				.70	1.00	1.25	1.80	2.50	4.25				
Return Bends, Open..Each				.80	1.10	1.40	2.15	3.00	4.75	8.25	11.00		
Y Bends...Each				.75	1.10	1.65	2.50	3.30	5.50	9.50	16.00		26.00

For Brass Unions, see page 365.

Right and Left Elbows, Right and Left Return Bends, also Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25 per cent over above prices.

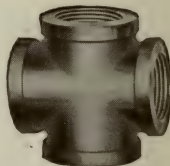


## BRASS STEAM FITTINGS

IRON PIPE SIZE

FINISHED

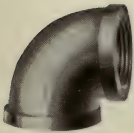
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size . . . . . Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows . . . . . Each	.30	.35	.45	.56	.75	1.10	1.55	2.00	3.00	5.50	9.00	14.00	17.50
Elbows, Reducing . . Each		.44	.55	.70	.95	1.40	1.90	2.50	3.75	6.75	11.25	17.50	22.00
Elbows, 45° . . . Each	.38	.45	.55	.66	.85	1.23	1.70	2.20	3.25	6.00	9.75		19.50
Elbows, Street . . . Each	.47	.52	.63	.83	1.08	1.45	2.30	3.00	4.50				
Elbows, Drop, Female . Each			.85	1.05	1.40	2.00	2.80	3.60	5.40				
Elbows, Side Outlet . Each			1.35	1.70	2.25	3.30	4.70	6.00	9.00	16.50	27.00		
Tees . . . . . Each	.42	.49	.63	.80	1.05	1.50	2.15	2.80	4.20	7.75	12.75	19.50	24.50
Tees, Reducing . . . Each		.60	.77	1.00	1.30	1.85	2.65	3.50	5.25	9.75	15.80	24.50	30.50
Tees, Drop, Female . . Each			1.13	1.37	1.80	2.55							
Tees, 4-Way . . . Each				2.05	2.70	3.90	5.70	7.40	11.50				
Crosses . . . . . Each	.60	.70	.90	1.10	1.50	2.20	3.10	4.00	6.00	11.00	18.00	28.00	35.00
Crosses, Reducing . . Each		.88	1.10	1.40	1.85	2.75	3.85	5.00	7.50	13.75	22.50	35.00	44.00
Bushings . . . . . Each		.22	.27	.35	.47	.70	1.00	1.40	2.00	3.00	4.50	6.25	8.00
Plugs . . . . . Each	.23	.30	.37	.43	.55	.75	1.00	1.30	1.95	3.00	4.25	6.25	8.00
Solid Plugs . . . Each			.43	.50	.65	.90	1.35	1.90	2.90	4.50	6.50	10.00	13.00
Countersunk Plugs . Each				.42	.55	.80	1.15	1.55	2.25				
Caps . . . . . Each	.20	.25	.31	.40	.55	.77	1.10	1.50	2.25	4.00	5.50	8.00	10.00
Lock-nuts . . . Each	.24	.25	.32	.40	.50	.65	.85	1.10	1.60	3.25	4.75	6.50	8.00
Reducers . . . . . Each		.35	.45	.56	.75	1.05	1.55	1.90	2.75	4.75	7.00	12.00	15.50
Couplings . . . . . Each	.24	.28	.36	.46	.63	.90	1.30	1.60	2.35	4.00	5.75	9.75	12.50
Couplings, R. & L. . Each		.37	.47	.58	.80	1.15	1.65	2.10	3.00	5.10	7.50		
Return Bends, Close . Each				1.55	2.05	2.65	3.75	4.90	7.25				
Return Bends, Open . Each				1.65	2.15	2.80	4.10	5.40	7.75	14.25	20.00		
Y Bends . . . . . Each				1.60	2.15	3.05	4.45	5.70	8.50	15.50	25.00		41.00

For Brass Unions, see page 365.

Right and Left Elbows, Right and Left Return Bends, also Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25 per cent over above prices.

**BRASS STEAM FITTINGS****IRON PIPE SIZE****FINISHED AND NICKEL PLATED****FOR STEAM WORKING PRESSURES UP TO 125 POUNDS**

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows.....Each	.36	.42	.53	.65	.87	1.25	1.75	2.25	3.35	6.15	10.00	16.00	20.00
Elbows, Reducing..Each		.52	.65	.82	1.10	1.60	2.15	2.85	4.15	7.60	12.50	20.00	25.00
Elbows, 45°..Each	.45	.53	.65	.78	1.00	1.43	1.95	2.55	3.65	6.85	11.00		22.50
Elbows, Street...Each	.54	.60	.73	.95	1.23	1.65	2.55	3.35	4.90				
Elbows, Drop, Female.Each			1.00	1.25	1.65	2.30	3.20	4.10	6.00				
Elbows, Side Outlet. Each			1.60	2.00	2.60	3.75	5.35	6.80	10.00	18.50	30.00		
Tees.....Each	.50	.58	.75	.93	1.22	1.70	2.45	3.15	4.65	8.65	14.00	22.30	28.00
Tees, Reducing....Each		.72	.90	1.15	1.50	2.10	3.00	3.95	5.85	10.90	17.50	28.00	35.00
Tees, Drop, Female..Each			1.33	1.62	2.15	2.95							
Tees, 4-Way.Each				2.35	3.05	4.35	6.35	8.20	12.50				
Crosses.....Each	.72	.84	1.05	1.30	1.75	2.50	3.50	4.50	6.70	12.30	20.00	32.00	40.00
Crosses, Reducing..Each		1.05	1.30	1.65	2.15	3.15	4.35	5.70	8.30	15.40	25.00	40.00	50.00
Bushings...Each		.26	.32	.42	.55	.82	1.15	1.65	2.35	3.50	5.15	7.10	9.00
Plugs.....Each	.28	.37	.45	.52	.67	.90	1.20	1.55	2.30	3.50	4.90	7.10	9.00
Solid Plugs..Each			.51	.59	.77	1.05	1.55	2.15	3.25	5.00	7.15	10.85	14.00
Countersunk Plugs.Each			.49	.63	.92	1.30	1.75	2.55					
Caps.....Each	.23	.29	.36	.47	.63	.89	1.25	1.75	2.60	4.50	6.15	8.85	11.00
Lock-nuts..Each	.29	.30	.39	.48	.60	.77	1.00	1.30	1.85	3.75	5.40	7.35	9.00
Reducers...Each		.42	.53	.65	.87	1.20	1.75	2.15	3.10	5.40	8.00	14.00	18.00
Couplings...Each	.29	.33	.42	.53	.72	1.00	1.45	1.80	2.60	4.50	6.50	11.25	14.25
Couplings, R. & L..Each		.44	.55	.67	.92	1.30	1.85	2.35	3.35	5.75	8.50		
Return Bends, Close.Each				1.85	2.40	3.10	4.40	5.70	8.25				
Return Bends, Open.Each				1.95	2.50	3.25	4.75	6.20	8.75	16.25	23.00		
Y Bends...Each				1.90	2.50	3.50	5.10	6.50	9.50	17.50	28.00		46.00

Right and Left Elbows, Right and Left Return Bends, also Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25 per cent over above prices.

## EXTRA HEAVY BRASS FITTINGS

ROUGH

MADE FROM STANDARD CAST IRON PATTERNS

FLAT BAND

CRANE SPECIAL BRASS

IRON PIPE SIZE

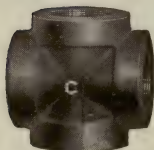
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



ELBOW



TEE



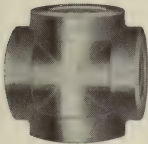
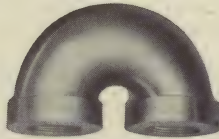
CROSS



RETURN BEND, OPEN

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows.....Each	.33	.45	.65	1.00	1.50	2.25	3.00	4.50	8.00	11.25	16.00	22.00
Elbows, Reducing..Each		.55	.75	1.20	1.80	2.60	3.50	5.25	9.00	13.00	19.00	25.00
Elbows, 45°..Each		.55	.75	1.10	1.65	2.50	3.25	4.50	8.00	11.25	16.00	22.00
Tees.....Each	.45	.60	.90	1.35	2.00	3.00	4.00	6.00	10.75	15.00	22.00	30.00
Tees, Reducing...Each		.70	1.05	1.55	2.30	3.50	4.50	6.75	12.00	17.00	25.00	35.00
Crosses.....Each			1.30	2.00	3.00	4.50	6.00	9.00	16.00	22.50	28.00	37.00
Crosses, Reducing..Each			1.50	2.40	3.60	5.25	7.00	10.50	18.00	26.00	32.00	42.00
Return Bends, Close..Each			1.65	2.50	3.50	5.00	7.00	10.00	16.00	22.00		40.00
Return Bends, Open..Each				2.75	4.00	5.50	8.00	11.00	18.00	25.00		45.00
Y Bends....Each			1.50	2.50	3.50	5.50	7.25	11.00	19.00	27.00	33.00	45.00
Couplings...Each	.40	.50	.70	1.10	1.65	2.25	3.00	4.50	7.00	10.00	13.00	17.00

Fittings can be furnished cast in Brass from any of our Standard or Extra Heavy Cast Iron Patterns. Prices will depend upon the quantity wanted.

**EXTRA HEAVY BRASS FITTINGS****FINISHED****MADE FROM STANDARD CAST IRON PATTERNS****FLAT BAND****CRANE SPECIAL BRASS****IRON PIPE SIZE****FOR STEAM WORKING PRESSURES UP TO 250 POUNDS****ELBOW****TEE****CROSS****RETURN BEND, OPEN**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Elbows.....Each	.73	.95	1.25	1.75	2.50	3.50	4.50	6.25	10.50	14.75	23.50	31.00
Elbows, Reducing...Each		1.15	1.50	2.10	3.00	4.10	5.35	7.50	12.00	17.25	28.00	36.00
Elbows, 45°..Each		1.15	1.50	2.00	2.85	4.00	5.10	6.75	11.00	15.50	25.00	33.00
Tees.....Each	1.00	1.25	1.70	2.35	3.35	4.65	6.00	8.35	14.00	19.75	32.00	42.00
Tees, Reducing...Each		1.50	2.05	2.80	4.00	5.50	7.00	9.75	16.00	23.00	37.00	50.00
Crosses.....Each			2.50	3.50	5.00	7.00	9.00	12.50	21.00	29.50	43.00	55.00
Crosses, Reducing..Each			3.00	4.25	6.00	8.25	10.75	15.00	24.00	35.00	50.00	64.00
Return Bends, Close..Each			2.85	4.00	5.50	7.50	10.00	13.50	21.00	29.00		58.00
Return Bends, Open..Each				4.25	6.00	8.00	11.00	14.50	23.00	32.00		63.00
Y Bends....Each			2.70	4.00	5.50	8.00	10.25	14.50	24.00	34.00	48.00	63.00
Couplings...Each	.75	.90	1.15	1.70	2.40	3.20	4.15	5.85	9.00	13.00	18.50	24.00

Fittings can be furnished cast in Brass from any of our Standard or Extra Heavy Cast Iron Patterns. Prices will depend upon the quantity wanted.

## **STANDARD**

### **CAST IRON AND MALLEABLE IRON**

### **SCREWED FITTINGS**

#### **MERITS OF STANDARD SCREWED FITTINGS**

The universal satisfaction expressed by all of our customers in the design, utility, strength and general appearance of our Standard Screwed Fittings fully justifies the statement that they have attained the highest degree of excellence.

In general design our Reducing Fittings are in direct proportion with the straight sizes, thus harmonizing the fittings in any combination of piping.

All fittings are recessed, permitting an easy entrance of the pipe, and are uniformly threaded to the American Briggs Standard Gauge, which steam fitters will appreciate.

These fittings are well proportioned, of good weight and suitable for the steam working pressures for which they are recommended.

#### **LARGELY INCREASED VARIETY OF SIZES**

We believe that the largely increased variety of straight and reducing sizes tabulated on pages 742 to 767 will be found sufficient to fully meet the requirements of the trade.

To avoid making fittings to order we recommend the use of bushings.

Where it is necessary to have special fittings made, without the use of bushings, we will, upon receipt of specifications, name prices, which, unless quantities are large, will be very high.

#### **GALVANIZED FITTINGS**

Such fittings as are listed on pages 742 to 767, and marked with an \* are carried in stock galvanized. Other sizes will be made to order only.

#### **TESTED FITTINGS**

Fittings tested to 200 pounds air pressure or 250 pounds water pressure will be made to order. Prices according to quantity wanted. Always state whether these fittings are to be used for steam, water, gas or air.



## **STANDARD CAST IRON FLAT BAND SCREWED FITTINGS**

**FOR STEAM WORKING PRESSURES UP TO 125 POUNDS  
FOR WATER WORKING PRESSURES UP TO 175 POUNDS**

We have, at various times, taken these fittings at random out of stock and subjected them to hydraulic pressures of 1,000 to 2,500 pounds, according to size, before breaking them. It is evident from these tests that we are supplying fittings with a very large factor of safety. But we do not recommend them for more than 125 pounds steam working pressure. It is not only a question of the fittings standing a higher pressure, but also the strain of expansion, contraction, weight of piping, settling and water hammer; there is also a possibility that they will not run uniform.

When fittings are wanted for a higher steam working pressure than 125 pounds, we recommend our Extra Heavy Fittings.

FOR GENERAL DIMENSIONS SEE PAGE 895

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## **STANDARD MALLEABLE IRON FLAT BAND SCREWED FITTINGS**

**FOR STEAM WORKING PRESSURES UP TO 150 POUNDS**

We have at various times subjected these fittings to hydraulic pressures of 2,000 to 4,000 pounds, without bursting them. See illustration of twisted test bar, page B.

It would seem that fittings which stand this test should be perfectly safe for 250 pounds steam working pressure. If proper care is exercised in using them, they will undoubtedly answer every purpose for pressures up to 500 pounds, but as all fittings are subjected to strain due to expansion, contraction or the making up of joints, we do not recommend them for more than 150 pounds working pressure.

As goods made especially for extra heavy pressures are so very cheap, it is false economy to use Standard fittings for Extra Heavy work.

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## **STANDARD MALLEABLE IRON PLAIN PATTERN SCREWED FITTINGS**

Plain pattern fittings are generally used for low pressure gas and water, house plumbing and railing work.

Plain fittings are dipped unless otherwise ordered.

### **AIR BRAKE FITTINGS**

We carry in stock specially tested Malleable Fittings for air brake use, as illustrated on page 352.

## STEAM AND GAS FITTINGS

### ELBOWS

### CAST IRON

STRAIGHT

R. and L. H. Elbows have Ribs on L. H. End



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, R. H.....Each	.05	.05	.06	.08	.10 $\frac{1}{2}$	.16	.20	.28	.50	.75
Price, R. and L...Each	.06	.06	.07	.09	.12	.18	.23	.32	.60	.85
Price, R. H., Galv..Each	.10	.10	.12	.16	.21	.32	.40	.56	1.00	1.50
Price, Pitched....Each			.08	.10	.13	.20	.25	.35	.65	1.00

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price, R. H.....Each	1.05	1.20	1.75	2.00	2.75	4.70	6.75	9.00	13.50	20.00
Price, R. H., Galv..Each	2.10	2.40	3.50	4.00	5.50	9.40	13.50	18.00	27.00	40.00
Price, Pitched....Each	1.30	1.50								



## REDUCING ELBOWS

CAST IRON

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....Each	.06	.07	.09	.12	.18	.23	.32	.60	.85	1.20
Price, Galv....Each		.14	.18	.24	.36	.46	.64	1.20	1.70	2.40
Price, Pitched..Each			.10	.13	.20	.25	.35	.65	1.00	1.30

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price.....Each	1.40	2.00	2.30	3.15	5.40	7.75	10.50	15.50	23.00	
Price, Galv....Each	2.80	4.00	4.60	6.30	10.80	15.50	21.00	31.00	46.00	

See page 742 for sizes of Reducing Elbows carried in stock.



## 45° ELBOWS

CAST IRON

We can make to order, 30° or any other special degree fittings, at a special price, according to sizes and quantities wanted.

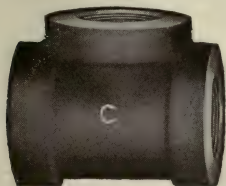
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.06	.06	.07	.10	.12	.19	.24	.34	.60	.90
Price, Galv....Each	.12	.12	.14	.20	.24	.38	.48	.68	1.20	1.80

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price.....Each	1.25	1.45	2.20	2.50	3.45	5.90	8.50	11.25	17.00	25.00
Price, Galv.....Each	2.50	2.90	4.40	5.00	6.90	11.80	17.00	22.50	34.00	50.00

## 60° AND 22 $\frac{1}{2}$ ° CAST IRON ELBOWS

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Price, 60° or 22 $\frac{1}{2}$ ° .Each	.25	.30	.35	.45	.50	.60	1.10	1.65	2.75	5.00	7.00

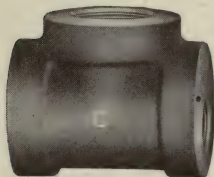
**TEES****CAST IRON****STRAIGHT**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10
Price, Galv....Each	.16	.16	.18	.24	.30	.46	.58	.82	1.46	2.20
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price.....Each	1.50	1.75	2.55	3.00	4.00	6.80	9.75	13.00	19.50	29.00
Price, Galv....Each	3.00	3.50	5.10	6.00	8.00	13.60	19.50	26.00	39.00	58.00

**REDUCING TEES****CAST IRON**

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....Each	.09	.10	.14	.17	.27	.33	.47	.83	1.25	1.75
Price, Galv....Each	.18	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price... ..Each	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50	
Price, Galv....Each	4.00	5.90	7.00	9.20	15.60	22.50	30.00	45.00	67.00	

See page 743 for sizes of Reducing Tees carried in stock.

**ECCENTRIC  
TEES****CAST IRON**

The object of these fittings is to prevent lodging places for water, which always is the case where double reducing fittings are used.

Some engineers believe that the lodging of water causes the pipe to eat away by rust.

Inquiries and orders for Eccentric Tees should be accompanied with a sketch showing the exact position in which the fitting is to be placed.

**PRICES ON APPLICATION**

# BRANCH TEES



No. 1\*



No. 2\*



No. 3\*

The run and back opening of Branch Tees are tapped the same size as branches, unless otherwise ordered.

NO. OF BRANCHES	1 IN. BRANCH TEES			1 1/4 IN. BRANCH TEES			1 1/2 IN. BRANCH TEES			2 IN. BRANCH TEES		
	2 1/2 in. Center to Center			3 in. Center to Center			3 1/2 in. Center to Center			4 1/2 in. Center to Center		
	1 in. or 1 1/4 in. Run	1 1/2 in. Run	2 in. Run	1 1/4 in. or 1 1/2 in. Run	2 in. Run	2 1/2 in. Run	1 1/2 in. or 2 in. Run	2 1/2 in. Run	3 in. Run	2 in. Run	2 1/2 in. or 3 in. Run	3 1/2 in. Run
2	.90	1.00	1.15	1.30			2.10			4.10		
3	1.05	1.15	1.35	1.65	1.90	2.40	2.70	3.45	3.80	5.25	5.75	6.25
4	1.15	1.30	1.60	2.00	2.40	2.85	3.35	4.15	4.60	6.40	7.00	7.75
5	1.35	1.45	1.85	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50	9.25
6	1.60	1.75	2.10	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75	10.75
7	1.90	2.20	2.45	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75	13.00
8	2.20	2.45	2.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75	14.00
9	2.65	2.90	3.40	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50	15.00
10		3.30	4.00	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00	16.50
11		4.50	4.80	5.00	6.25	7.25	8.00	9.75	10.75			
12		4.75	5.10	5.25	6.50	7.65	8.50	10.50	11.50			
13		5.50	6.00	6.00	7.00	8.25						
14		7.00	7.25	6.75	7.75	9.00						
15		7.50	7.75	7.50	8.50	9.75						
16		8.00	8.25	8.50	9.50	10.75						

BACK OR SIDE OUTLETS CHARGED AS ADDITIONAL FRONT OUTLETS

\*Nos. 1 and 2 Branch Tees with branches tapped left hand, and No. 3 Branch Tees with branches tapped right hand, can be furnished at the regular prices.

1 inch Branch Tees, 1 inch or 1 1/4 inch run, are 1 3/4 inches inside diameter. 1 inch Branch Tees, 1 1/2 inch or 2 inch run, are 2 1/4 inches inside diameter.

1 1/4 inch Branch Tees are all 2 1/2 inches inside diameter.

1 1/2 inch Branch Tees are all 2 3/4 inches inside diameter.

2 inch Branch Tees are all 3 1/2 inches inside diameter.

Always order Branch Tees by size and number.



**CROSSES****CAST IRON****STRAIGHT**

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Price.....Each	.16	.22	.27	.42	.53	.75	1.30	2.00	2.70
Price, Galv.Each	.32	.44	.54	.84	1.06	1.50	2.60	4.00	5.40
Size.....Inches	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	3.15	4.60	5.50	7.25	12.25	17.50	23.50	35.00	52.50
Price, Galv.Each	6.30	9.20	11.00	14.50	24.50	35.00	47.00	70.00	105.00

**REDUCING CROSSES****CAST IRON**

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Price.....Each	.18	.25	.30	.46	.60	.83	1.45	2.20	3.00
Price, Galv.Each	.36	.50	.60	.92	1.20	1.66	2.90	4.40	6.00
Size.....Inches	4	4 1/2	5	6	7	8	9	10	12
Price.....Each	3.50	5.10	6.00	8.00	13.50	19.25	26.00	38.50	58.00
Price, Galv.Each	7.00	10.20	12.00	16.00	27.00	38.50	52.00	77.00	116.00

See page 746 for list of Reducing Crosses carried in stock.

**REDUCERS****CAST IRON**

Size.....Inches	4 1/2	5	6	7	8	9	10	12
Price.....Each	1.85	2.00	2.70	5.35	6.75	8.35	10.00	15.00
Price, Galv.....Each	3.70	4.00	5.40	10.70	13.50	16.70	20.00	30.00

**ECCENTRIC REDUCERS****CAST IRON**

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Price.....Each	.55	.72	1.00	1.50	2.40	3.00	4.00	5.00	6.00	8.00	9.00	11.00





## CAPS

### CAST IRON

Size.....Inches	4	4½	5	6	7	8	9	10	12
Price.....Each	.87	1.05	1.20	1.55	2.50	2.85	4.75	5.50	7.00
Price, Galv.Each	1.74	2.10	2.40	3.10	5.00	5.70	9.50	11.00	14.00



## Y BENDS

### CAST IRON

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½
Price.....Each	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Price, Galv.Each	.40	.56	.68	1.08	1.32	1.88	3.32	5.00	7.00

Size.....Inches	4	4½	5	6	7	8	10	12	
Price.....Each	4.00	5.90	7.00	9.20	15.60	22.50	45.00	67.00	
Price, Galv.Each	8.00	11.80	14.00	18.40	31.20	45.00	90.00	134.00	

## LOCK NUTS

### CAST IRON

Size.....Inches	2½	3	3½	4	4½	5
Price.....Each	.27	.34	.47	.64	.85	.90
Price, Galvanized.....Each	.54	.68	.94	1.28	1.70	1.80

Size.....Inches	6	7	8	9	10	12
Price.....Each	1.30	1.70	2.35	2.70	3.00	4.00
Price, Galvanized.....Each	2.60	3.40	4.70	5.40	6.00	8.00

The Threads of our Hexagon Lock Nuts conform to the American Briggs Standard, adopted by the Committee of Manufacturers, March 16, 1915.

RUN



RUN

## MEDIUM SWEEP

## REDUCING DOUBLE BRANCH ELBOWS

### No. 7. CAST IRON

INLET

Size.....Inches	1×1×1¼	1¼×1¼×1½	1½×1½×2	2×2×2½
Price.....Each	.75	1.05	1.50	2.25
Size.....Inches	2½×2½×3	3×3×4	4×4×5	5×5×6
Price.....Each	4.25	6.50	12.00	16.50

In describing Medium Reducing Double Branch Elbows, the Run is first named, then the Inlet.

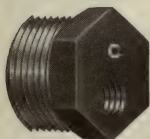
## BUSHINGS

### CAST IRON

REDUCING TWO OR MORE SIZES, UP TO 2 1-2 INCH, INCLUSIVE  
REDUCING ONE OR MORE SIZES, 3 INCH AND UP



Size.....Inches	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....Each	.04	.04	.05	.06	.07	.09	.14	.21	.30	.40
Price, Galvanized...Each	.08	.08	.10	.12	.14	.18	.28	.42	.60	.80
Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price.....Each	.50	.75	.93	1.25	1.87	2.75	3.25	3.75	5.00	
Price, Galvanized...Each	1.00	1.50	1.85	2.50	3.75	5.50	6.50	7.50	10.00	



## ECCENTRIC BUSHINGS

### CAST IRON

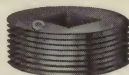
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Price.....Each	.22	.25	.27	.42	.60	.80	1.00	1.50
Size.....Inches	5	6	7	8	9	10	12	
Price.....Each	1.85	2.50	3.75	5.50	6.50	7.50	10.00	



SQUARE HEAD

## PLUGS

### CAST IRON



COUNTERSUNK

### SQUARE HEAD

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.02	.02	.02	.02	.03	.04	.05	.07	.10	.18	.25
Price, Galvanized..Each		.04	.04	.04	.06	.08	.10	.14	.20	.36	.50
Price, Tapped for Air Cock..Each					.12	.15	.20	.25	.30		
Price, L. H. Plugs..Each				.04	.06	.08	.09	.11	.15		
Price, Solid Plugs..Each		.04	.04	.04	.06	.08	.09	.11	.15	.27	.38
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price.....Each	.38	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00	
Price, Galvanized..Each	.76	.84	1.30	1.75	2.40	3.70	5.50	6.50	7.50	10.00	
Price, Solid Plugs..Each	.57	.63	1.00	1.35	1.80						

### COUNTERSUNK

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.04	.04	.06	.08	.09	.11	.15
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	
Price.....Each	.30	.40	.92	1.10	2.00	3.50	

## RETURN BENDS

### CAST IRON

CLOSE



OPEN



### RETURN BENDS, CLOSE PATTERN

#### CAST IRON

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	4
Price, Right Hand.....Each	.18	.20	.22	.28	.40	.57	1.20	1.70	5.00
Price, Right and Left.....Each	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
Price, Left Hand.....Each	.21	.23	.26	.33	.46	.66	1.40	1.95	5.25
Price, Right Hand, Galv.....Each	.36	.40	.44	.56	.80	1.14	2.40	3.40	10.00
Center to Center.....Inches	1¼	1½	1¾	2¼	2½	3¼	3¾	4¼	6

Close Pattern Return Bends will not make up parallel coils, as the distance, center to center, of two adjacent bends is greater than the center to center of openings of a single bend.

### RETURN BENDS, CLOSE PATTERN, PITCHED

#### CAST IRON

SUITABLE FOR COILS AS PER TABLE BELOW

Size.....Inches	1	1	1	1	1	1¼	1¼	1¼
Length of Pipe in Coil.....Feet	3	4	5	6	8	4	5	6
Price, Right Hand.....Each	.26	.26	.26	.26	.26	.33	.33	.33

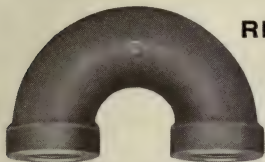
All Right and Left Pitched Return Bends are made to order.  
One inch Return Bends for coils longer than 8 feet are tapped straight.  
Pitched Return Bends have length of coils marked on them.

### RETURN BENDS, OPEN PATTERN

#### CAST IRON

Size.....Inches	¾	1	1¼	1½	2	2½	3	4
Price, Right Hand.....Each	.26	.30	.40	.55	.80	1.35	2.20	6.50
Price, Right and Left.....Each	.30	.35	.46	.64	.92	1.55	2.50	
Price, Right Hand, Galv.....Each	.52	.60	.80	1.10	1.60	2.70	4.40	10.00
Center to Center.....Inches	1½	2¾	3	3½	4½	5½	6½	7½

FOR OTHER CAST IRON RETURN BENDS OF VARYING CENTERS, SEE EXTRA  
HEAVY CAR HEATER PATTERN, PAGE 341.

**RETURN BENDS****CAST IRON****WIDE PATTERN****RIGHT HAND****WITH UNION ENDS**

Size.....Inches	1	1	1	1	1	1¼	1¼	1¼
Price.....Each	.45	.50	.60	.75	1.00	1.00	1.25	*
Price, Galv.....Each	.80	.90	1.10	1.30	1.60	1.75	2.00	*
Center to Center, Inches	3	4	5	6	8	4	6	8

Size.....Inches	1½	1½	1½	2	2	2	2	4
Price.....Each	1.30	1.60	2.00	1.75	2.00	3.00	3.50	7.50
Price, Galv.....Each	2.30	2.60	3.25	3.00	3.25	4.50	5.00	11.00
Center to Center, Inches	4⅞	6	8	4⅞	6	7	8	11

\*See page 341 for price of 1¼×8 Return Bends.

**WITH UNION ENDS**

Size.....Inches	1¼	2
Price.....Each	1.60	3.00
Center to Center.....Inches	4⅝	6

**RETURN BENDS****CAST IRON****SPECIAL PATTERNS: MADE TO ORDER ONLY**

Size.....Inches	1	1	2	2	2½
Center to Center.....Inches	4¾	4½	2⅞	3	4½

**RETURN BENDS****BACK OUTLET****CAST IRON**

Size.....Inches	¾	1	1¼	1½	2	2½	3
Price, Right Hand.....Each	.38	.42	.60	.80	1.15	2.00	3.00
Price, Right and Left...Each	.42	.48	.70	.95	1.30	2.30	3.50
Price, Right Hand, Galv.Each	.76	.84	1.20	1.60	2.30	4.00	6.00
Center to Center.....Inches	1⅞	2¼	2¼	2½	3¼	3¾	4¼

**RETURN BENDS, BACK OUTLET****CAST IRON****SPECIAL PATTERNS: MADE TO ORDER ONLY**

Size.....Inches	1	1¼	1½	2
Center to Center.....Inches	4	3¼	4	4
Size, Back Outlet.....Inches	1¼	1½	1½	1½

The back outlet of Right and Left Return Bends is always tapped right hand.

## AMERICAN STANDARD SPRINKLER FITTINGS

The Fittings shown on page 339 are designed in accordance with the rules and requirements of the National Fire Protection Association and are known as "AMERICAN STANDARD SPRINKLER FITTINGS." They are made in sizes 2½ to 6 inch, inclusive, in the various types shown.

Our regular Standard Cast Iron Screwed Fittings, sizes 2 inch and smaller, and our Standard Flanged Fittings, sizes 7 inch and larger, are acceptable to the National Fire Protection Association, and with the fittings shown on page 339 form a complete line of fittings for sprinkler service.

Screwed fittings, flanged fittings, and combination screwed and flanged fittings all have the same center to end dimensions for each respective size.

Reducing fittings will not have any opening less than 50 per cent of the largest opening.

When one end is flanged, the largest opening will be flanged unless otherwise specified.

Fittings are guaranteed for water working pressures up to 150 pounds and are marked **CRANE** and **CU** ; W denoting water and CU their suitability for fire protection service.  
**W150**

Tappings will be provided only for drain or test purposes, in which case fittings will be provided with bosses for tapping when required if the location and size of tapping are specified. Slip bosses having blind holes will be provided when required to act as sockets for supports. Fittings 2½ to 6 inch, inclusive, may be tapped ½ inch on the side without boss and fittings larger than 6 inch may be tapped ¾ inch without boss.

For list of sizes, see pages 750 to 752.

In describing Tees and Crosses the run is first named and then the outlet or outlets.

All Flanges and Drilling Templates are the "AMERICAN STANDARD."



# AMERICAN STANDARD SPRINKLER FITTINGS

## CAST IRON

### FOR FIRE PROTECTION SERVICE

#### FOR WATER WORKING PRESSURES UP TO 150 POUNDS

#### ELBOWS



STYLE A



STYLE B



STYLE C



STYLE D



STYLE E

#### TEES



STYLE G



STYLE H



STYLE K



STYLE L



STYLE M



STYLE N

#### CROSSES



STYLE O



STYLE P



STYLE R



STYLE S

Size.....Inches	2½	3	3½	4	5	6
Style A, Elbows.....Each	1.20	2.25	3.25	3.50	6.50	8.75
Style B, Elbows.....Each	5.50	6.00	6.50	7.50	10.00	14.00
Style C, Elbows.....Each	6.75	7.50	8.50	10.00	12.50	17.50
Style D, Elbows.....Each		8.00		11.00	15.00	18.00
Style G, Tees.....Each	2.40	4.50	6.50	7.00	13.00	17.50
Style G, Tees, Reducing....Each	3.60	6.75	9.75	10.50	19.50	26.25
Style H, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style K, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style L, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style M, Tees.....Each	9.00	10.00	11.00	12.00	15.00	22.00
Style N, Tees.....Each	10.00	11.50	13.00	15.00	18.00	26.00
Style O, Crosses.....Each	3.20	6.00	8.75	9.50	17.50	24.00
Style P, Crosses.....Each	12.50	13.50	15.00	17.00	22.00	30.00
Style R, Crosses.....Each	12.50	13.50	15.00	17.00	22.00	30.00
Style S, Crosses.....Each	13.50	15.00	17.00	20.00	25.00	35.00

Furnished Galvanized at double the above prices.

The above prices include the facing and drilling of the flanges.

For list of sizes, see pages 750 to 752.

Sizes not listed above, prices on application.

Templates for drilling, page 650.

These Fittings are designed in accordance with the rules and requirements of the National Fire Protection Association and are marked "CU" to denote their use for fire protection service.

## LONG SWEEP FITTINGS

## CAST IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FOR WATER WORKING PRESSURES UP TO 150 POUNDS

No. 1  
ELBOWNo. 2  
DOUBLE BRANCH  
ELBOWNo. 3  
TEENo. 4  
CROSSNo. 5  
TEE

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 1 Elbows....Each	.26	.32	.40	.55	.80	1.20	2.25	3.25	3.50
No. 1 Elbows, Reducing.. Ea.	.40	.48	.60	.83	1.20	1.80	3.38	4.88	5.25
No. 2 Dbl. Branch Elbows. Ea.		.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
No. 2 Dbl. Branch Elb., Red'g. Ea.		.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50
No. 5 Tees.....Each		.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
No. 5 Tees, Reducing. Each		.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50
No. 3 Tees.....Each		.48	.60	.82	1.20	1.80	3.40	4.90	5.25
No. 3 Tees, Reducing. Each		.72	.90	1.23	1.80	2.70	5.10	7.35	7.88
No. 4 Crosses....Each		.85	1.10	1.50	2.15	3.20	6.00	8.75	9.50
No. 4 Crosses, Reducing.. Ea.			1.65	2.25	3.23	4.80	9.00	13.13	14.25
Size.....Inches	$4\frac{1}{2}$	5	6	7	8	9	10	12	
No. 1 Elbows....Each	5.50	6.50	8.75	13.00	17.00	25.50	30.00	40.00	
No. 1 Elbows, Reducing.. Ea.	8.25	9.75	13.13	19.50	25.50	38.25	45.00	60.00	
No. 2 Dbl. Branch Elbows. Ea.	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00	
No. 2 Dbl. Branch Elb., Red'g. Ea.	16.50	19.50	26.25	39.00	51.00	76.50	90.00	120.00	
No. 5 Tees.....Each	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00	
No. 5 Tees, Reducing. Each	16.50	19.50	26.25	39.00	51.00	76.50	90.00	120.00	
No. 3 Tees.....Each	8.25	9.75	13.25	19.50	25.50	38.00	45.00	60.00	
No. 3 Tees, Reducing. Each	12.58	14.63	19.88	20.25	38.25	57.00	67.50	90.00	
No. 4 Crosses....Each		17.50	24.00	35.00	45.00	68.00	80.00	107.00	
No. 4 Crosses, Reducing.. Ea.		26.25	36.00	52.50	67.50	102.00	120.00	160.50	

Furnished Galvanized at double above list.

For Long Sweep Fittings with Flanged Ends, see page 339.

For List of sizes, see pages 753 to 755.

# CAST IRON CAR HEATER FITTINGS EXTRA HEAVY

## ELBOWS



Size Inches	PRICE	
	R. H. Each	R. and L. Each
$\frac{1}{2}$	.22	.22
$\frac{3}{4}$	.25	.25
1	.27	.27
$1\frac{1}{4}$	.30	.30
$1\frac{1}{2} \times 1\frac{1}{4}$	.45	.45
$1\frac{1}{2}$	.45	.45
2	.55	.55

## TEES



Size Inches	Price Each
$\frac{1}{2}$	.30
$\frac{3}{4}$	.35
1	.40
$1\frac{1}{4}$	.45
$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	.45
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	.45
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	.45
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	.65
$1\frac{1}{2}$	.65
2	.85

## RETURN BENDS



Size Inches	Distance Between Centers	PRICE	
		R. H. Each	R. and L. Each
1	$2\frac{3}{8}$	.45	.52
$1\frac{1}{4}$	$2\frac{1}{2}$	.45	.52
$1\frac{1}{4}$	3	.50	
$1\frac{1}{4}$	4	.60	
$1\frac{1}{4}$	5	.70	
$1\frac{1}{4}$	6	.85	
$1\frac{1}{4}$	8	1.10	
$1\frac{1}{2}$	$2\frac{1}{2}$	.80	.90
$1\frac{1}{2}$	$3\frac{1}{2}$	1.25	1.25
2	$3\frac{3}{4}$	1.00	1.15
2	$4\frac{1}{2}$	1.75	
2	6	2.00	

**RETURN BENDS  
WITH BACK OUTLET  
PRICES ON APPLICATION**

Size Inches	O. to O.	Back Outlet
2	4	$1\frac{1}{2}$
$1\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$

CAR HEATER FITTINGS

EXTRA HEAVY

CAST IRON COUPLINGS



Size Inches	PRICE		Size Inches	PRICE	
	R. H. Each	R. and L. Each		R. H. Each	R. and L. Each
1	.25	.35	1½	.45	.55
1¼	.30	.40	2	.55	.65

WROUGHT COUPLINGS



Size Inches	Actual Outside Diameter Inches	Length of Couplings Inches	PRICE			
			R. H. Black Each	R. and L. Black Each	R. H. Galvanized Each	R. and L. Galvanized Each
½	1.13	1.88	.14	.20	.20	.25
¾	1.44	2.13	.20	.30	.25	.35
1	1.63	2.38	.26	.40	.32	.45
1¼	2.13	2.13	.34	.45	.42	.55
1½	2.31	2.87	.42	.55	.55	.70
2	2.81	3.13	.56	.70	.75	.90

# EXTRA HEAVY CAST IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**ELBOW**

THESE FITTINGS ARE TESTED  
TO HYDRAULIC PRESSURES  
CORRESPONDING TO THE  
ABOVE WORKING  
PRESSURE



**45° ELBOW**

For Extra Heavy Cast  
Iron Return Bends, see  
page 341.



**TEE**



**CROSS**

Size . . . . . Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Elbows . . . . . Each	.25	.30	.35	.45	.60	.75	1.25	2.00	2.75
Elbows, Reducing . Each		.40	.45	.55	.75	.95	1.55	2.50	
45° Elbows . . . Each	.35	.40	.44	.55	.70	.90	1.50	2.50	3.50
Tees . . . . . Each	.40	.45	.55	.70	.90	1.15	1.80	3.00	4.25
Tees, Reducing . . Each		.60	.70	.90	1.15	1.40	2.25	3.75	5.30
Crosses . . . . . Each			.70	.90	1.20	1.50	2.50	4.00	5.50
Y Bends . . . . . Each				1.35	1.80	2.25	3.75	6.00	
Plugs . . . . . Each	.04	.06	.08	.09	.11	.15	.27	.38	.57
Size . . . . . Inches	4	$4\frac{1}{2}$	5	6	7	8	10	12	
Elbows . . . . . Each	3.50	4.25	5.50	8.00	12.00	17.00	28.00	40.00	
Elbows Reducing . Each	4.40		6.80						
45° Elbows . . . Each	4.50	5.50	6.75	9.75	14.50	21.00	34.00	48.00	
Tees . . . . . Each	5.50	6.75	8.25	12.00	18.00	25.00	42.00	60.00	
Tees, Reducing . . Each	6.85	8.50	10.25	15.00	22.50	31.00	52.00	75.00	
Crosses . . . . . Each	7.00	8.50	11.00	16.00	24.00	34.00	56.00	80.00	
Y Bends . . . . . Each	11.00			24.00	36.00	50.00			
Plugs . . . . . Each	.63	1.00	1.35	1.80					

## GALVANIZED EXTRA HEAVY FITTINGS DOUBLE ABOVE LIST

The radius of these Fittings is longer than the ordinary, thereby reducing friction.

We do not recommend the use of Screwed Fittings above 6 inch; for larger sizes, flanged are more suitable.

For list of sizes of Reducing Fittings carried in stock, see pages 756 and 757. Should other sizes be wanted, we will make them to order by bushing in the sand to the required size, and will charge extra, according to quantity wanted.



**ELBOWS****MALLEABLE IRON****STRAIGHT AND REDUCING**

Size .....	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, R. H. ....	Each	.06	.07	.08	.10	.15	.22	.25	.35
Price, R. and L. ....	Each		.09	.11	.13	.17	.25	.30	.40
Price, Galv., R. H. ...	Each	.08	.09	.11	.14	.20	.32	.40	.60
Price, R. and L., Galv. ....	Each		.12	.16	.17	.23	.35	.45	.65
Size .....	Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price, R. H. ....	Each	.50	.90	1.50	2.25	3.00	3.50	4.00	6.50
Price, R. and L. ....	Each	.65							
Price, Galv., R. H. ...	Each	.90	1.50	2.60	3.75	5.00		6.50	10.00
Price, R. and L., Galv. ....	Each	1.00							

**45° ELBOWS****MALLEABLE IRON**

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price. ....	Each	.08	.10	.12	.18	.26	.36	.54	.82
Price, Galvanized. ...	Each	.12	.15	.20	.25	.40	.50	.85	1.35
Size .....	Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	
Price. ....	Each	1.25	2.50	3.25	4.50	5.25	6.00	7.50	
Price, Galvanized. ...	Each	1.90	3.75	4.75	6.75		9.00	11.00	

**60° ELBOWS****MALLEABLE IRON**

Size .....	Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price .....	Each	.30	.45	.65
Price, Galvanized. ....	Each	.45	.70	1.05

**STREET ELBOWS****MALLEABLE IRON**

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price.....Each	.08	.10	.10	.12	.20	.25	.40	.55	.90	1.50	2.25	3.50
Price, Galvanized Each	.10	.12	.12	.15	.28	.35	.55	.80	1.30	2.25	3.50	
Price, 45°.....Each	.12	.12	.12	.12	.20	.25	.40	.55	.90		2.25	3.50
Price, 45°, Galv...Each	.15	.15	.15	.15	.28	.35	.55	.80	1.30			

**SIDE OUTLET ELBOWS****MALLEABLE IRON**

Size...Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price...Each	.08	.08	.10	.18	.30	.45	.60	1.00
Price, Galv. Each	.10	.10	.15	.25	.45	.65	.90	1.50

**DROP ELBOWS****MALLEABLE IRON**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Female .....Each	.06	.08	.12	.20
Price, Female, Galv.....Each	.09	.12	.20	.35
Price, Male and Female..Each		.08	.12	
Price, Male and Female, Galvanized..Each		.12	.20	

**LONG****DROP ELBOWS****MALLEABLE IRON**

Size.....Inches	$\frac{1}{4} \times \frac{3}{8}$	$\frac{3}{8} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{3}{4}$	$\frac{3}{4} \times 1$
Price.....Each	.10	.10	.18	.18
Price, Galvanized.....Each	.18	.18	.27	.27
Drop Length, over all.....Inches	$2\frac{3}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{3}{8}$



TEES

MALLEABLE IRON

STRAIGHT AND REDUCING

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Price.....Each	.07	.08	.09	.11	.15	.25	.30	.45
Price, Galvanized .Each	.09	.10	.13	.16	.20	.38	.50	.70
Size.....Inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Price.....Each	.60	1.05	1.70	2.50	3.40	4.25	5.00	7.75
Price, Galvanized .Each	1.00	1.90	3.00	4.25	5.75		8.00	12.00

Parties desiring R. & L. Tees will state, when ordering, which hole is to be tapped left hand. Such goods can always be furnished to order.

FOR 7 AND 8 INCH MALLEABLE FITTINGS, SEE PAGE 352



SERVICE TEES

MALLEABLE IRON

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3x2 1/2x3	3x3x4
Price.....Each	.12	.15	.25	.35	.50	.75	1.15	2.00	2.50	2.50	4.00
Price, Galv.Each	.15	.20	.35	.50	.70	1.10	1.65				



FOUR WAY TEES

MALLEABLE IRON

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Price.....Each	.12	.12	.14	.20	.35	.50	.80	1.25
Price, Galvanized .Each	.17	.17	.20	.28	.50	.70	1.10	1.75

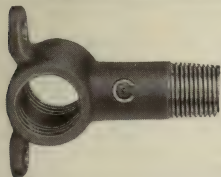


DROP TEES

MALLEABLE IRON

1/2, 3/4 and 1 inch male and female, also 1 inch female Drop Tees, are made only in the reducing sizes shown on page 764.

Size.....Inches	3/8	1/2	3/4	1
Price, Female.....Each	.10	.14	.22	.30
Price, Female, Galvanized.....Each	.15	.25	.40	
Price, Male and Female.....Each	.10	.14	.22	.30
Price, Male and Female, Galvanized.....Each	.15	.25	.40	



LONG

## DROP TEES

MALLEABLE IRON

Size.....Inches	$\frac{3}{8}$	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1 \times 1 \times \frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$
Price.....Each	.12	.30	.40	.60
Price, Galvanized.....Each	.17			
Drop Length, Over All..Inches	$2\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$3\frac{3}{4}$



## WASH TRAY TEES

MALLEABLE IRON

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4} \times \frac{1}{2}$
Price, Galvanized.....Each	.20	.30	.30

## PARTITION TEES AND CROSSES

MALLEABLE IRON

 $6\frac{1}{2}$  INCHES END TO END OF RUN

Size.....Inches	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	$\frac{3}{8} \times \frac{1}{2}$	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8} \times \frac{1}{2}$
Price, Tees.....Each	.20	.25	
Price, Tees, Galvanized.....Each	.28	.35	
Price, Crosses.....Each	.25	.30	.30
Price, Crosses, Galvanized.....Each	.35	.40	.40

Male ends are  $\frac{3}{8}$  inch size.

## CROSS OVERS

MALLEABLE IRON



CROSS OVERS

CROSS OVER TEES

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1
Price, Cross Overs.....Each	.20	.30	.45
Price, Cross Overs, Galvanized.....Each	.25	.40	.60
Price, Cross Over Tees, Galvanized.....Each	.38	.56	



## CROSSES

### MALLEABLE IRON

#### STRAIGHT AND REDUCING

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Price.....Each	.09	.10	.16	.20	.30	.40	.60
Price, Galvanized.....Each	.12	.14	.25	.29	.45	.60	.90

Size.....Inches	2	2 1/2	3	3 1/2	4	5	6
Price.....Each	1.00	1.75	3.00	3.25	5.25	7.50	13.00
Price, Galvanized.....Each	1.50	2.75	4.50		8.00		



## REDUCERS

### MALLEABLE IRON

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4
Price.....Each	.05	.06	.07	.10	.16	.20
Price, Galvanized.....Each	.08	.10	.10	.15	.25	.35

Size.....Inches	1 1/2	2	2 1/2	3	3 1/2	4
Price.....Each	.28	.45	.70	1.00	1.50	1.85
Price, Galvanized.....Each	.45	.75	1.05	1.65	2.40	3.05



SHOULDER

## BUSHINGS

### MALLEABLE IRON

#### REDUCING ONE SIZE ONLY



FACE

#### SHOULDER

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price.....Each	.04	.04	.04	.05	.06	.07	.09	.14	.21
Price, Galv.Each	.08	.08	.08	.10	.12	.14	.18	.28	.42

#### FACE

Size.....Inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.08	.09	.11	.13	.17	.22	.32	.48	.70
Price, Galvanized.....Each	.12	.14	.17	.20	.25	.33	.48	.72	1.05

Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	10	12
Price.....Each	1.20	1.50	2.10	2.60	3.75	8.00	9.00	14.00	20.00
Price, Galvanized.....Each	1.80	2.25	3.15	3.90	5.60				



**CAPS****MALLEABLE IRON**

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	.03	.03	.04	.05	.08	.12	.16	.24
Price, Galvanized . Each	.04	.04	.05	.08	.12	.17	.24	.38

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	
Price.....Each	.32	.45	.85	1.00	1.20	2.50	3.50	
Price, Galvanized . Each	.52	.76	1.30	1.60	2.00	3.50	5.00	

We can furnish "HEXAGON" Malleable Caps, sizes  $\frac{1}{4}$ ,  $\frac{3}{8}$  and  $\frac{1}{2}$  inch, at a special price.

**Y BENDS****MALLEABLE IRON****STRAIGHT AND REDUCING**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price.....Each	.40	.50	.60	.80	1.00	1.70	2.00	4.00	5.50
Price, Galvanized . Each	.60	.75	.90	1.25	1.50	2.50	3.00	6.00	8.25

**60° Y BENDS****MALLEABLE IRON**

Size.....Inches	$2 \times 2$	$2 \times 1\frac{1}{2}$
Price.....Each	1.70	1.70
Price, Galvanized.....Each	2.50	2.50

**LOCK NUTS****MALLEABLE IRON**

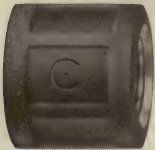
Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.02	.02	.03	.04	.05	.07	.09	.11	.18
Price, Galvanized . Each		.03	.04	.05	.07	.10	.14	.20	.30

The threads of our Hexagon Lock Nuts conform to the American Briggs Standard, adopted by the Committee of Manufacturers, March 16, 1915.



**WASTE NUTS**  
**MALLEABLE IRON**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	.04	.05	.06	.08	.10	.15	.25
Price, Galvanized.....Each	.08	.10	.12	.16	.20	.30	.50



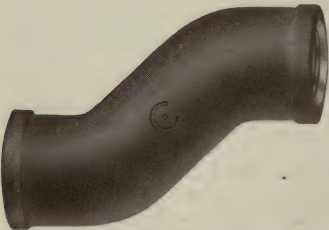
**MALLEABLE IRON COUPLINGS**  
**RIBBED, RIGHT AND LEFT**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.04	.06	.08	.12	.16	.25	.36	.52	.70	1.00
Price, Galvanized.....Each	.06	.09	.10	.17	.25	.35	.55	.75	1.05	1.50



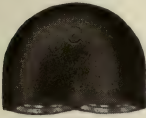
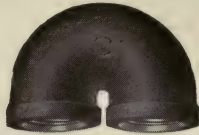
**MALLEABLE IRON COUPLINGS**  
**RIGHT HAND**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.03	.05	.07	.10	.14	.20	.25	.35	.60	.90
Price, Galvanized.....Each	.05	.07	.10	.17	.23	.30	.40	.55	.95	1.40



**OFFSETS**  
**MALLEABLE IRON**

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....Each	.25	.40	.75
Offset.....Inches	$1\frac{1}{2}$	$1\frac{1}{2}$	2
Length.....Inches	$3\frac{1}{4}$	4	$5\frac{3}{8}$

**MALLEABLE IRON RETURN BENDS****CLOSE****MEDIUM****RETURN BENDS, CLOSE OR MEDIUM PATTERNS**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Right Hand.....Each	.18	.25	.35	.50	.75	1.00
Price, Right Hand, Galv.....Each	.25	.35	.55	.75	1.15	1.65
Price, Right and Left.....Each	.23	.30	.45	.60	.90	1.25
Price, R. and L., Galv. Close..Each	.35	.40	.65	.85	1.30	1.90
Price, R. and L., Galv. Medium..Each		.40	.65			
Price, Left Hand.....Each	.23	.30	.45	.60	.90	1.25
Center to Center, Close....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{5}{8}$
Center to Center, Medium...Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	3

Close Pattern Return Bends will not make up parallel coils, as the distance, center to center, of two adjacent bends is greater than the center to center of openings of a single bend.

**OPEN****SPECIAL WIDE****RETURN BENDS, OPEN PATTERN**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Right Hand..Each	.20	.30	.50	.65	.85	1.25	2.00	3.00
Price, Right Hand, Galv. . . Each	.28	.45	.70	.90	1.25	2.00	3.50	5.00
Price, Right and Left. . . . Each	.25	.38	.60	.80	1.05	1.55	2.50	3.75
Price, Right and Left, Galv .Each		.55	.80	1.05	1.50	2.40		
Price, Left Hand. . .Each	.25	.38	.60	.80	1.05	1.55	2.50	3.75
Center to Center. Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5

**RETURN BENDS, SPECIAL WIDE PATTERN, RIGHT HAND**

Size.....Inches	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price.....Each	.25	1.00	1.25	1.25	1.25	2.00
Price, Galvanized.....Each	.30	1.35	1.65	1.70	1.70	2.75
Center to Center.....Inches	$1\frac{1}{2}$	4	6	6	6	6
Size.....Inches	2	3	3	4	6	
Price.....Each	3.00	5.00	5.00	8.00	16.00	
Price, Galvanized.....Each	4.00	6.50	6.50			
Center to Center.....Inches	5	$7\frac{1}{2}$	8	6	12	

# SPECIAL TESTED AIR BRAKE FITTINGS

MALLEABLE IRON



## PRICE LIST ELBOWS

Size . . . . . Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2}$
Elbow, Right Hand. Each	.07	.08	.10	.15	.22	.25	.25	.35
Elbows, R. and L. . Each	.09	.11	.13	.17	.25	.30	.30	.40
Street Elbows, R.H. Each	.10	.10	.12	.20	.25	.40	.40	.55

## PRICE LIST TEES

Size . . . . . Inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{4}$	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$\frac{3}{4}$	$1 \times 1 \times \frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Tees . . . . . Each	.08	.11	.15	.15	.15	.15	.25	.25	.30	.45

# LARGE SPECIAL MALLEABLE FITTINGS

STANDARD PATTERN, BEADED

Size . . . . . Inches	7	8	8×3	8×4	8×6
Price, Elbows . . . . . Each	15.00	20.00			
Price, 45° Elbows . . . . . Each		20.00			
Price, Tees . . . . . Each	21.00	25.00			
Price, Tees, Reducing . . . . . Each			25.00	25.00	25.00

10 and 12 inch Malleable Fittings will be made to order from our Standard, Flat Band, Cast Iron Patterns; Prices on application.



## OFFSET REDUCING COUPLINGS

### MALLEABLE IRON

This Fitting is the same as a Male and Female Reducer, except that the inlet and outlet are on the same level. By its use water pockets are prevented.

Size.....Inches	1×¾	1¼×1	1½×1¼	2×1½	2½×2	3×2½
Price.....Each	.60	.70	.90	1.10	1.80	2.50
Size.....Inches	3½×3	4×3	4×3½	4½×4	5×4	5×4½
Price.....Each	3.00	4.00	4.00	5.00	6.00	6.00

The male end is the large size.

## CHANDELIER HOOKS AND LOOPS

EXTENSION PIECE



WALL PLATE



Size.....Inches	¾	1½	¾
Price, Extension Pieces.....Each	.06	.09	.12
Price, Extension Pieces, Galvanized.....Each	.09	.13	.18
Price, Chandelier Hooks or Loops.....Each	.10	.12	
Price, Wall Plates.....Each	.12	.16	.30

Can furnish Male Hooks when so specified.

## R. AND L. NIPPLES WITH HEXAGON CENTERS

### MALLEABLE IRON



Size.....Inches	¼	¾	½	¾	1	1¼	1½	2	2½	3	3½	4
Price.....Each	.20	.20	.20	.25	.30	.40	.50	.70	1.10	1.50	1.90	2.40

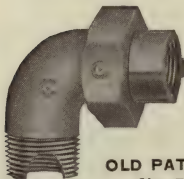
Right Hand Hexagon Nipples made to order at a special price.



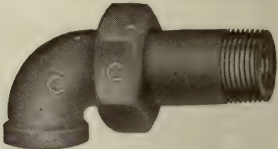
CIRCULATING  
BOILER FITTINGS

MALLEABLE IRON

GALVANIZED



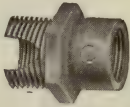
OLD PATTERN  
No. 585



NEW PATTERN  
No. 586



No.  
587



No. 588



No. 589

Size.....Inches	Female, Male. $\frac{3}{4} \times \frac{3}{4} \times 1$	Female, Male. $\frac{3}{4} \times \frac{1}{2} \times 1$	Female, Male. $\frac{1}{2} \times \frac{1}{2} \times 1$
Price, Boiler Elbows, Galv. . . . Each	.40	.40	.40
Price, Boiler Elbows, with Union, Galvanized. . Each	.75	.75	.60
Price, Boiler Coupling, Galv. . . Each	.40	.40	.40
Price, Boiler Coupling, with Union, Galvanized. Each	.75	.75	.60

In ordering always specify whether "old pattern" or "new pattern" Union Elbow is required. Unless otherwise specified "old pattern" Union Elbows will be furnished.

To avoid mistakes, particular care should be used in making orders quite clear for the above fittings.

SPECIAL PATTERN  
CIRCULATING BOILER TEES

MALLEABLE IRON

GALVANIZED



Size.....Inches	$\frac{3}{4} \times \frac{1}{2} \times 1$
Price, without Union ..... Each	.50
Price, with Union..... Each	.80



# WATER PIPE CLAMPS

## MALLEABLE IRON

### WITH WROUGHT IRON STRAP



NUMBER	CLAMPS WILL FIT				Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, inches	Price Each	NUMBER	CLAMPS WILL FIT				Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, inches	Price Each
	Outside Diameter of Circle, inches	Size Wrought Iron Pipe, inches	Size Outside Diameter Casing, inches	Size Cast Iron Pipe, inches				Outside Diameter of Circle, inches	Size Wrought Iron Pipe, inches	Size Outside Diameter Casing, inches	Size Cast Iron Pipe, inches		
0	1 $\frac{1}{8}$	1 $\frac{1}{2}$	2		$\frac{1}{2}$ and $\frac{3}{4}$	1.00	19	6 $\frac{5}{8}$	6	6 $\frac{5}{8}$		$\frac{3}{4}$ to 1 $\frac{1}{2}$	2.25
1	2 $\frac{3}{8}$	2	2 $\frac{1}{2}$		$\frac{1}{2}$ to 1	1.00	20	6 $\frac{5}{8}$	6	6 $\frac{5}{8}$		2	2.50
2	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$ & 3	2	$\frac{1}{2}$ to 1 $\frac{1}{4}$	1.25	21	6 $\frac{5}{8}$	6	6 $\frac{5}{8}$		2 $\frac{1}{2}$ and 3	5.00
3	3 $\frac{1}{2}$	3	3 $\frac{1}{2}$		$\frac{1}{2}$ to 1	1.25	22	7		7	6	$\frac{3}{4}$ to 1 $\frac{1}{2}$	2.50
4	3 $\frac{1}{2}$	3	3 $\frac{1}{2}$		1 $\frac{1}{4}$ to 2	1.50	23	7		7	6	2	2.70
5	4	3 $\frac{1}{2}$	4	3	$\frac{1}{2}$ to 1	1.50	24	7		7	6	2 $\frac{1}{2}$ and 3	5.00
6	4	3 $\frac{1}{2}$	4	3	1 $\frac{1}{4}$ to 2	1.75	25	7 $\frac{7}{8}$	7	7 $\frac{7}{8}$		$\frac{3}{4}$ to 1 $\frac{1}{2}$	2.50
7	4 $\frac{1}{2}$	4	4 $\frac{1}{2}$		$\frac{1}{2}$ to 1 $\frac{1}{2}$	1.75	26	7 $\frac{7}{8}$	7	7 $\frac{7}{8}$		2	2.70
8	4 $\frac{1}{2}$	4	4 $\frac{1}{2}$		2	2.00	27	7 $\frac{7}{8}$	7	7 $\frac{7}{8}$		2 $\frac{1}{2}$ and 3	5.00
9	4 $\frac{1}{2}$	4	4 $\frac{1}{2}$		2 $\frac{1}{2}$ and 3	4.00	28	8		8	7	$\frac{3}{4}$ to 1 $\frac{1}{2}$	4.50
10	5	4 $\frac{1}{2}$	5	4	$\frac{3}{4}$ to 1 $\frac{1}{2}$	1.80	29	8		8	7	2	5.00
11	5	4 $\frac{1}{2}$	5	4	2	2.15	30	8		8	7	2 $\frac{1}{2}$ and 3	5.50
12	5	4 $\frac{1}{2}$	5	4	2 $\frac{1}{2}$ and 3	4.00	30 $\frac{1}{2}$	8 $\frac{5}{8}$	8	8 $\frac{5}{8}$		$\frac{3}{4}$ to 1 $\frac{1}{2}$	5.50
13	5 $\frac{1}{2}$	5	5 $\frac{1}{2}$		$\frac{3}{4}$ to 1 $\frac{1}{2}$	1.80	31	8 $\frac{5}{8}$	8	8 $\frac{5}{8}$		2 to 3	5.50
14	5 $\frac{1}{2}$	5	5 $\frac{1}{2}$		2	2.15	32	8 $\frac{5}{8}$	8	8 $\frac{5}{8}$		4	6.00
15	5 $\frac{1}{2}$	5	5 $\frac{1}{2}$		2 $\frac{1}{2}$ and 3	4.00	33	9 $\frac{5}{8}$	9			1 $\frac{1}{2}$ to 3	8.00
16	6		6	5	$\frac{1}{2}$ to 1 $\frac{1}{2}$	2.00	34	10		10	9	$\frac{3}{4}$ to 2	9.00
17	6		6	5	2	2.40	35	10 $\frac{3}{4}$	10			$\frac{3}{4}$ to 2	9.00
18	6		6	5	2 $\frac{1}{2}$ and 3	4.50	36	12 $\frac{3}{4}$	12			$\frac{3}{4}$ to 2	10.00

Always order Water Pipe Clamps by number.

Size No. 33 has malleable iron strap.

# STEAM PIPE SADDLES

MALLEABLE IRON

WITH WROUGHT STRAPS

FOR WROUGHT PIPE



Size of Pipe.....Inches	1½	2	2½	3	3½	4	4½
Tapped for Pipe ... Inches	½ and ¾	½ to 1½	¾ to 1½	¾ to 2	¾ to 2	¾ to 2	¾ to 2
Price.....Each	.90	1.00	1.25	1.25	1.40	1.50	2.50
Size of Pipe.....Inches	5	5	6	6	7	8	9
Tapped for Pipe ... Inches	¾ to 2	2½ and 3	¾ to 2	2½ to 4	1 to 4	1 to 4	1½ to 4
Price.....Each	2.75	2.75	2.75	5.75	6.50	6.50	8.50
Size of Pipe.....Inches	10	10	12	12	15	16	
Tapped for Pipe ... Inches	1½ to 4	4½ to 6	1½ to 4	4½ to 6	3 to 6	3 to 6	
Price.....Each	10.00	10.00	14.00	14.00	22.00	25.00	

## CRANE CEILING PLATES

### FOR WROUGHT PIPE

This simple device enables the steamfitter to put up the pipe first, then the plates afterward, thereby saving a great deal of labor and annoyance, as is the case in using the old style, which is made in one piece.

Care is taken to insure perfect fit, each piece being interchangeable.



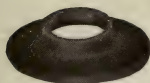
No. 4

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Price.....Each	.22	.28	.32	.40	.50	.65	.90	1.00	1.20	2.00	2.50	3.75

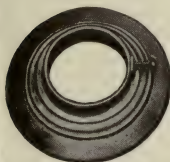
## FLOOR AND CEILING PLATES

### ONE PIECE

### CAST IRON

No. 5  
FLOOR PLATE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Floor Plates..Each	.06	.06	.08	.11
Ceiling Plates..Each	.11	.13	.16	.18
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	
Floor Plates..Each	.14	.16	.24	
Ceiling Plates..Each	.23	.27	.36	

No. 7  
CEILING PLATE

No. 8

## CEILING PLATES

### IN ONE PIECE

Size.....Inches	3	$3\frac{1}{2}$	4	5	6
Price.....Each	.50	.55	.68	.95	1.25

## CRANE FLOOR PLATES



No. 9

This Floor Plate is made with grooves on the under side of the flange, as shown in cut, in order that it may be easily parted by a slight blow when required to be used in halves.



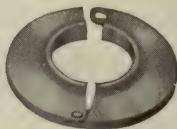
No. 9

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Price.....Each	.06	.06	.08	.11	.14	.16	.24	.30	.35	.42	.60	.75	1.75

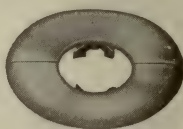
## BEATON'S FLOOR AND CEILING PLATES



No. 3  
CEILING PLATE



No. 6  
FLOOR PLATE



No. 10  
PERFECTION

PRICE LIST NOS. 3, 6 AND 10—NICKEL PLATED								
Size...Inches	½	¾	1	1¼	1½	2	2½	3
Price...Each	.27	.28	.32	.35	.38	.45	.65	.80

COLD ROLLED STEEL,  
HINGED, FLOOR AND  
CEILING PLATE

Larger sizes, prices on application.

## CRANE TELESCOPING FIRE-PROOF FLOOR SLEEVES

### GALVANIZED SHEET IRON

WITH NEAT CAST IRON FLANGE ON TOP AND BOTTOM

Easily adjusted to any permanent position within its range of length. Has no screws, slots or springs to get out of order.

We have designed these Galvanized Sheet Iron Floor Sleeves to meet the demand for a cheaper article than Cast Iron Floor Sleeves.

#### No. 1

Size of Pipe.....Inches	¾	1	1¼
Minimum Length.....Inches	12	12	12
Maximum Length.....Inches	17	17	17
Price No. 1.....Each	1.00	1.10	1.30

#### No. 2

Size of Pipe..Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Minimum Length..Inches	14	14	14	14	14	14	14	14	14	14	14	14
Maximum Length..Inches	24	24	24	24	24	24	24	24	24	24	24	24
Price No. 2... Each	1.05	1.20	1.35	1.50	1.80	2.10	2.50	3.00	3.75	4.50	5.25	6.75





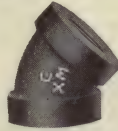
## EXTRA HEAVY MALLEABLE IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

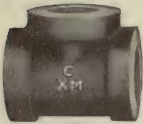
THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING  
TO THE ABOVE WORKING PRESSURES



**ELBOW**



**45° ELBOW**



**TEE**



**CROSS**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Elbows.....Each	.20	.25	.30	.35	.40	.55	.70
45° Elbows.....Each	.25	.30	.35	.42	.50	.65	.85
Long Sweep Elbows....Each					.64	.80	1.10
Tees.....Each	.30	.40	.45	.50	.60	.80	1.05
Crosses.....Each	.60	.80	.90	1.00	1.20	1.60	2.10
Reducers.....Each			.28	.30	.40	.45	.55
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Elbows.....Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
45° Elbows.....Each	1.10	1.85	2.85	4.00	5.00	7.50	10.50
Long Sweep Elbows....Each	1.60	2.40	4.50	6.50	7.00	13.00	17.50
Tees.....Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
Crosses.....Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50
Reducers.....Each	.70	1.30	12.25				

For Malleable Iron Fittings for High Pressure Air Service, up to 500 pounds, see page 497.

Galvanized Extra Heavy Malleable Fittings made to order at 50% advance on above list.

Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order by bushing in the sand from the straight patterns, at a special price, according to quantity wanted.

For Reducing Sizes Elbows, Tees and Reducers carried in stock, see pages 768 and 769.

Reducing Elbows and Tees carried in stock, furnished at same price as straight sizes.

SEE PAGE 360 FOR EXTRA HEAVY HYDRAULIC MALLEABLE IRON FITTINGS  
Special Extra Heavy Malleable Iron Return Bends, page 506.

**EXTRA HEAVY HYDRAULIC  
MALLEABLE IRON FITTINGS**

**FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS :**

1 INCH AND SMALLER, 2000 LBS. HYDROSTATIC; 1¼ TO 2 INCH, 1500 LBS. HYDROSTATIC; 2½ TO 4 INCH, 1000 LBS. HYDROSTATIC; 5 AND 6 INCH, 800 LBS. HYDROSTATIC; 8 INCH, 600 LBS. HYDROSTATIC; 10 AND 12 INCH, 500 LBS. HYDROSTATIC

When these fittings are used on pipe lines subject to shock, sizes 6 inch and smaller are good for 500 pounds working pressure and sizes 8 to 12 inch, inclusive, for 400 pounds.

THESE FITTINGS ARE TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE ABOVE WORKING PRESSURES.



**ELBOW  
No. 260 H**



**45° ELBOW  
No. 262 H**



**LONG SWEEP ELBOW  
No. 263 H**



**TEE No. 264 H**



**CROSS No. 266 H**



**REDUCER No. 267 H**

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Elbows, No. 260 H.....Each	.20	.25	.30	.35	.40	.55	.70	.90	1.50	2.40
45° Elbows, No. 262 H..Each	.25	.30	.35	.42	.50	.65	.85	1.10	1.85	2.85
L. S. Elbows, No. 263 H..Each					.64	.80	1.10	1.60	2.40	4.50
Tees, No. 264 H.....Each	.30	.40	.45	.50	.60	.80	1.05	1.35	2.25	3.60
Crosses, No. 266 H.....Each	.60	.80	.90	1.00	1.20	1.60	2.10	2.70	4.50	7.20
Reducers, No. 267 H....Each				.30	.40	.45	.55	.70		

Size.....Inches	3½	4	5	6	8	10	12
Elbows, No. 260 H.....Each	3.25	4.25	6.50	9.50	21.00	37.00	60.00
45° Elbows, No. 262 H..Each	4.00	5.00	7.50	10.50			
L. S. Elbows, No. 263 H..Each	6.50	7.00	13.00	17.50			
Tees, No. 264 H.....Each	5.00	6.50	9.75	14.25	32.00	55.00	90.00
Crosses, No. 266 H.....Each	10.00	13.00	19.50	28.50			

**WORKING PRESSURES**

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

**AIR OR GAS**

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order by bushing in the sand from the Straight Patterns, at a special price, according to quantity wanted.

For Reducing Sizes Elbows, Tees and Reducers carried in stock, see pages 768 and 769. Reducing Elbows and Tees carried in stock, furnished at same price as straight sizes. For general dimensions, see page 698.

## EXTRA HEAVY CAST STEEL SCREWED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

3 TO 4½ INCH, INCLUSIVE, UP TO 1500 POUNDS; 5 AND 6 INCH  
UP TO 1200 POUNDS

TESTED TO HYDRAULIC PRESSURES CORRESPONDING TO THE  
ABOVE PRESSURES



**No. 260 D  
ELBOWS**



**No. 262 D  
45° ELBOWS**



**No. 264 D  
TEES**



**No. 266 D  
CROSSES**

Size.....Inches	3	3½	4	4½	5	6
No. 260 D, Elbows.....Each	6.00	7.75	8.50	10.00	12.00	16.50
No. 262 D, 45° Elbows.....Each	6.00	7.75	8.50	10.00	12.00	16.50
No. 264 D, Tees.....Each	9.00	11.50	12.75	15.00	18.00	25.00
No. 266 D, Crosses.....Each	12.00	15.50	17.00	20.00	24.00	33.00

The radius of these Fittings is longer than the ordinary, thereby reducing friction.

For Steel Screwed Fittings, sizes ½ to 2½ inch, inclusive, see pages 362 and 363.

### WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

These Fittings may also be used with superheated steam up to 350 pounds and a total temperature of 800 degrees Fahrenheit.

## EXTRA HEAVY HYDRAULIC FORGED STEEL SCREWED FITTINGS

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND  
A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE



**No. 300 D  
ELBOW**



**No. 302 D  
45° ELBOW**



**No. 304 D  
TEE**

Size.....Inches	½	¾	1	1¼	1½	2	2½
No. 300 D, Elbows.....Each	1.40	1.50	1.60	1.75	2.10	2.50	4.00
No. 301 D, Reducing Elbows..Each	1.70	1.80	1.95	2.10	2.50	3.00	4.80
No. 302 D, 45° Elbows...Each	1.40	1.50	1.60	1.75	2.10	2.50	4.00
No. 304 D, Tees.....Each	2.10	2.25	2.40	2.65	3.15	3.75	6.00
No. 306 D, Reducing Tees...Each	2.50	2.75	3.00	3.25	3.75	4.50	7.00

These Fittings are made from solid forgings.

### WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

For general dimensions, see page 699.

Larger sizes made to order of Cast Steel. Prices on application.

## DOUBLE EXTRA HEAVY HYDRAULIC FORGED STEEL SCREWED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS HYDROSTATIC

TESTED TO 6000 POUNDS HYDRAULIC PRESSURE



No. 310 D  
ELBOW



No. 312 D  
45° ELBOW



No. 314 D  
TEE

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 310 D, Elbows.....Each	1.90	2.00	2.15	2.40	2.75	3.25	5.00
No. 311 D, Reducing Elbows...Each		2.40	2.60	2.90	3.30	3.90	6.00
No. 312 D, 45° Elbows...Each		2.00	2.15	2.40	2.75	3.25	5.00
No. 314 D, Tees.....Each	2.85	3.00	3.25	3.50	4.00	4.75	7.00
No. 316 D, Reducing Tees...Each		3.40	3.75	4.10	4.75	5.50	8.00

These Fittings are made from solid forgings.

### WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

For general dimensions, see page 699.

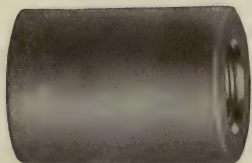
Larger sizes made to order of Cast Steel. Prices on application.

Fittings for higher pressures made to order. Prices on application.

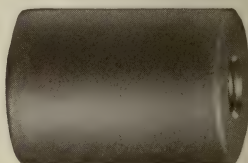


## SPECIAL HYDRAULIC ROLLED STEEL FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS HYDROSTATIC



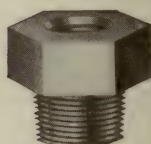
**COUPLING**



**REDUCING COUPLING**



**PLUG**



**BUSHING**

**SIZES  $\frac{3}{8}$  TO 2 INCH, INCLUSIVE**

These Fittings are made to order only. Prices on application.

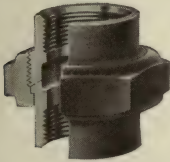
### **WORKING PRESSURES**

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures.** See explanatory notes on page 153.

### **AIR OR GAS**

Fittings for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

## BRASS UNIONS



No. 521 1/2  
ROUGH

GROUND JOINT

NO GASKET REQUIRED

FOR STEAM WORKING PRESSURES UP TO  
150 POUNDS

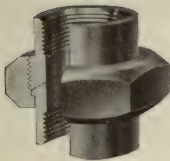
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	*2 1/2	*3
No. 521 1/2, Rough . . . . . Each	.50	.65	.85	1.15	1.60	2.25	2.70	4.00	7.50	11.50

\*Made to order only.

## FOR STEAM WORKING PRESSURES

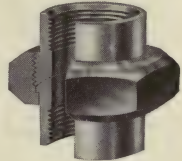
SIZES 3 INCH AND SMALLER, UP TO 200 POUNDS

SIZES 3 1/2 INCH AND 4 INCH, UP TO 125 POUNDS



No. 522  
SEMI-FINISHED

Unless otherwise specified,  
No. 522 Semi-Finished Un-  
ions will always be furnished.



No. 523  
FINISHED

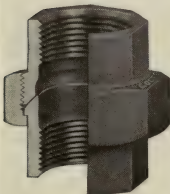
Size.....Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4
No. 522, Semi-Finished.. Each	.45	.55	.75	.95	1.30	1.75	2.50
No. 523, Finished . . . . . Each	.50	.60	.85	1.05	1.40	1.90	2.75

Size.....Inches	1 1/2	2	*2 1/2	*3	*3 1/2	*4	
No. 522, Semi-Finished.. Each	3.00	4.50	8.25	12.75	22.50	30.00	
No. 523, Finished . . . . . Each	3.25	5.00	9.00	14.00	25.00	33.00	

\*Made to order only.

NOS. 522 AND 523 TAKE DIFFERENT DISCOUNTS



FOR STEAM WORKING PRESSURES UP TO  
200 POUNDS

Size.....Inches	1/4	3/8	1/2	3/4	1
No. 523 1/2, Rough... Each	.65	.85	1.10	1.50	2.00

Size.....Inches	1 1/4	1 1/2	2	*2 1/2	*3
No. 523 1/2, Rough... Each	2.80	3.60	5.25	9.00	14.00

\*Made to order only.

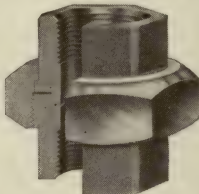
No. 523 1/2 Unions comply with U. S. Navy speci-  
fications in design and material.

No. 523 1/2  
OCTAGON ENDS  
GOVT. PATTERN, ROUGH

## BRASS UNIONS

### EXTRA HEAVY

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS  
CRANE SPECIAL BRASS



GROUND TAPER JOINT

NO GASKET REQUIRED

RING FINISHED

HEXAGON TAIL PIECES  
ROUGH

No. 96 E

Size.....Inches		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 96 E .....	Each	1.10	1.40	1.60	1.85	3.00
Size.....Inches		$1\frac{1}{4}$	$1\frac{1}{2}$	2	$*2\frac{1}{2}$	$*3$
No. 96 E .....	Each	4.00	5.25	7.50	10.00	15.00

\*Made to order only.

## HYDRAULIC

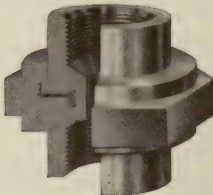
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

$\frac{1}{4}$  INCH TO  $1\frac{1}{4}$  INCH, 2000 POUNDS HYDROSTATIC

$1\frac{1}{2}$  INCH AND 2 INCH, 1500 POUNDS HYDROSTATIC

$2\frac{1}{2}$  INCH AND 3 INCH, 1000 POUNDS HYDROSTATIC

CRANE SPECIAL BRASS



FINISHED  
ALL OVER

FITTED WITH  
COPPER GASKET

No. 240 H

Size.....Inches		$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 240 H .....	Each	1.25	1.50	2.00	3.00	4.00
Size.....Inches		$1\frac{1}{4}$	$1\frac{1}{2}$	2	$*2\frac{1}{2}$	$*3$
No. 240 H .....	Each	5.00	7.00	10.00	12.00	15.00

\*Made to order only.

## WORKING PRESSURES

No. 240 H Unions are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

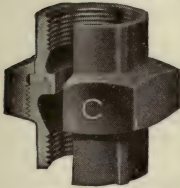
Unions for Air or Gas are SPECIAL. See explanatory notes on page 153.

## STANDARD UNIONS

### MALLEABLE IRON

FOR STEAM WORKING PRESSURES  
UP TO 150 POUNDS

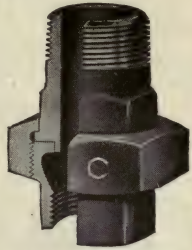
GASKET EXTRA



FEMALE UNION



FEMALE TWO-THIRD  
UNION



MALE AND FEMALE  
UNION

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Female Union, Black... Each	.18	.18	.20	.22	.27	.33	.46
Female Union, Galv.... Each	.27	.27	.30	.33	.40	.50	.70
Male and Female Union, Black.. Each		.23	.25	.28	.33	.40	.57
Male and Female Union, Galv.... Each		.32	.35	.39	.46	.57	.81
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	
Female Union, Black... Each	.58	.75	1.55	2.10	3.65	4.35	
Female Union, Galv.... Each	.90	1.15	2.35	3.15	5.50	6.50	
Male and Female Union, Black.. Each	.72	.95	1.95				
Male and Female Union, Galv.... Each	1.04	1.35	2.75				

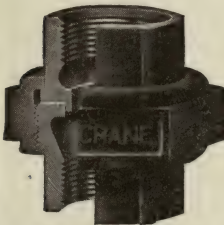
### LIST PRICES OF FEMALE TWO-THIRD UNIONS

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price.....Each	.12	.14	.16	.19	.22	.30
Price, Galvanized.....Each	.18	.20	.22	.25	.35	.50
Size.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Each	.40	.50	1.00	1.40	2.40	3.00
Price, Galvanized.....Each	.60	.75	1.60	2.10	3.70	4.35

## CRANE UNIONS

MALLEABLE IRON

EXTRA HEAVY METALLIC GASKET  
FOR STEAM WORKING PRESSURES  
UP TO 250 POUNDS



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....Each	.20	.24	.28	.35	.40
Price, Galv.... Each	.24	.28	.35	.46	.55
Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.56	.80	.95	2.00	2.75
Price, Galv.... Each	.78	1.12	1.35	2.90	3.75

The Crane Union is extra heavy, and has a metallic gasket. The face of the Union, being corrugated, holds the metallic gasket in place. This improvement makes the blowing out of the gasket absolutely impossible. Should it at any time be necessary to replace the gasket, it can be readily done.

## MALLEABLE IRON BRASS TO IRON SEAT UNIONS

MALLEABLE ENDS

MALLEABLE HEXAGON RING

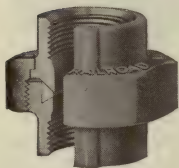
OUR BRASS TO IRON SEAT UNIONS HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

### RAILROAD UNIONS

No. 519

FOR STEAM WORKING PRESSURES UP TO  
250 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



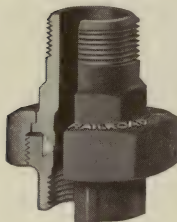
No. 519  
FEMALE ENDS

Size.....Inches	1/8	1/4	3/8	1/2	3/4	1
Price.....Each	.30	.30	.40	.50	.60	.80
Price, Galvanized . Each	.45	.45	.60	.75	.90	1.20
Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	
Price.....Each	1.20	1.60	2.00	3.20	4.80	
Price, Galvanized . Each	1.80	2.40	3.00	4.80	6.20	

No. 519 1/2

FOR STEAM WORKING PRESSURES UP TO  
200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



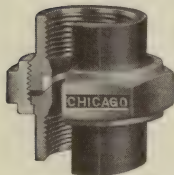
No. 519 1/2  
MALE AND FEMALE ENDS

Size.....Inches	1/4	3/8	1/2	3/4	1
Price.....Each	.38	.50	.62	.75	1.00
Price, Galvanized . . . Each	.53	.70	.87	1.05	1.40
Size.....Inches	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	1.50	2.00	2.50	4.00	6.00
Price, Galvanized . . . Each	2.10	2.80	3.50	5.60	8.40

### CHICAGO UNIONS WITH BRASS HEXAGON RING

FOR STEAM WORKING PRESSURES UP TO  
200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE



No. 515

Size.....Inches	1/4	3/8	1/2	3/4	1
Price.....Each	.19	.22	.27	.40	.48
With Galvanized Ends. Each	.23	.26	.34	.49	.60
Size.....Inches	1 1/4	1 1/2	2	2 1/2	3
Price.....Each	.66	.80	1.14	2.10	2.65
With Galvanized Ends. Each	.82	1.10	1.40	2.75	3.50

The brass seat ring is forced into place by special machinery and cannot loosen.

The seats are ground in, so that a tight joint is obtained.

The brass to iron seat eliminates the use of gaskets, and causes less trouble in making up pipe lines. New Unions are not needed when a joint is broken as the brass to iron seat makes it possible to use them again and again.



# MALLEABLE IRON UNIONS NAVY

OCTAGON ENDS

BRASS TO IRON SEAT

GROUND JOINT

NO GASKET REQUIRED

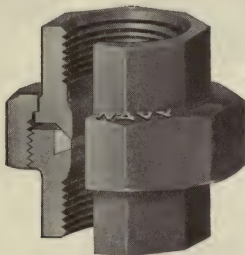
## EXTRA HEAVY

FOR STEAM WORKING PRESSURES AS FOLLOWS:

$\frac{1}{4}$  TO 2 INCH, INCLUSIVE, 300 POUNDS  
2 $\frac{1}{2}$  AND 3 INCH, 250 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE

CRANE NAVY UNIONS WITH BRASS TO IRON SEAT HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.



No. 98 E

Size.....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....	Each	.30	.40	.50	.60	.80
Price, Galvanized.....	Each	.45	.60	.75	.90	1.20
Size.....	Inches	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price.....	Each	1.20	1.60	2.00	3.20	4.80
Price, Galvanized.....	Each	1.80	2.40	3.00	4.80	6.20

These Unions have been re-designed and improved and are now furnished with octagon ends.

These are excellent Unions for severe service as all parts are of heavy construction.

The brass ring is forced into place by special machinery and cannot loosen.

The seats are ground in, so that a tight joint is obtained.

The brass to iron seat eliminates the use of gaskets, and causes less trouble in making up pipe lines. New Unions are not needed when a joint is broken as the brass to iron seat makes it possible to use them again and again.

Brass to brass seats will be made to order at special price.

We also furnish Extra Heavy Cast Iron Navy Flange Unions, No. 99E of similar construction, as shown page 376.

# RAILROAD UNION ELBOWS

## BRASS TO IRON SEAT

GROUND JOINT  
NON-CORROSIVE

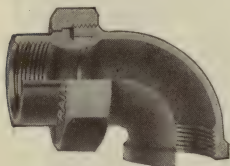
NO GASKET REQUIRED  
READILY TAKEN APART

## MALLEABLE IRON

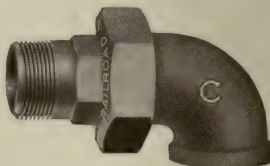
FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

TESTED TO 250 POUNDS HYDRAULIC PRESSURE

OUR BRASS TO IRON SEAT RAILROAD UNION ELBOWS HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

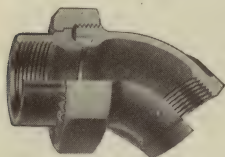


**No. 590 ELBOW  
WITH FEMALE UNION**

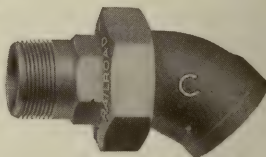


**No. 592 ELBOW  
WITH MALE UNION**

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price, No. 590, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80
Price, No. 590, Galvanized...Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00	6.40
Price, No. 592, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80
Price, No. 592, Galvanized...Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00	6.40



**No. 591 ELBOW  
WITH FEMALE UNION**



**No. 593 ELBOW  
WITH MALE UNION**

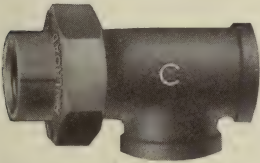
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Price, No. 591, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00
Price, No. 591, Galvanized....Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00
Price, No. 593, Elbow.....Each	.45	.60	.75	.90	1.20	1.80	2.40	3.00
Price, No. 593, Galvanized....Each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00

THESE FITTINGS ARE OF THE SAME CONSTRUCTION AS OUR RAILROAD UNIONS SHOWN ON PAGE 368, COMBINING ALL THE ADVANTAGES AND FEATURES OF MERIT THAT HAVE MADE THESE UNIONS THE STANDARD ON MANY RAILROADS. THE CONSTANTLY GROWING DEMAND IS OUR STRONGEST RECOMMENDATION.

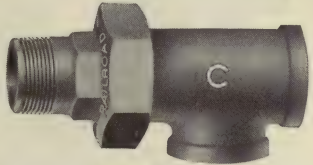
FOR GENERAL DIMENSIONS, SEE PAGE 700

**RAILROAD UNION TEES****BRASS TO IRON SEAT**GROUND JOINT  
NON-CORROSIVENO GASKET REQUIRED  
READILY TAKEN APART**MALLEABLE IRON****FOR STEAM WORKING PRESSURES UP TO 200 POUNDS****TESTED TO 250 POUNDS HYDRAULIC PRESSURE**

OUR BRASS TO IRON SEAT RAILROAD UNION TEES HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

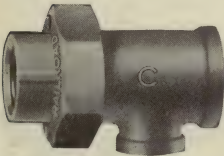


**No. 594 TEE**  
**WITH FEMALE UNION**



**No. 596 TEE**  
**WITH MALE UNION**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, No. 594, Tee.....Each	.50	.66	.82	.99	1.32	1.98	2.64	3.30	5.30
Price, No. 594, Galvanized..Each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10
Price, No. 596, Tee.....Each	.50	.66	.82	.99	1.32	1.98	2.64	3.30	5.30
Price, No. 596, Galvanized..Each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10

**REDUCING RAILROAD UNION TEES**

**No. 595**  
**WITH FEMALE UNION**



**No. 597**  
**WITH MALE UNION**

Size.....Inches	$1x\frac{3}{8}$	$1x\frac{1}{2}$	$1x\frac{3}{4}$
No. 595.....Each	1.45	1.45	1.45
No. 595, Galvanized.....Each	1.95	1.95	1.95
No. 597.....Each	1.45	1.45	1.45
No. 597, Galvanized.....Each	1.95	1.95	1.95

THESE FITTINGS ARE OF THE SAME CONSTRUCTION AS OUR RAILROAD UNIONS SHOWN ON PAGE 368, COMBINING ALL THE ADVANTAGES AND FEATURES OF MERIT THAT HAVE MADE THESE UNIONS THE STANDARD ON MANY RAILROADS. THE CONSTANTLY GROWING DEMAND IS OUR STRONGEST RECOMMENDATION.

FOR GENERAL DIMENSIONS, SEE PAGE 700

UNION ELBOWS

MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

GASKETS EXTRA



WITH FEMALE UNION



WITH MALE UNION

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Price, with Female Union.....Each	.38	.40	.42	.54	.63	.90	1.05	1.55	2.85
Price, with Female Union, Galvanized, Each	.57	.60	.63	.81	.95	1.35	1.58	2.35	4.30
Price, with Male Union..Each	.43	.45	.48	.62	.72	1.05	1.20	1.80	3.30
Price, with Male Union, Galvanized..Each	.65	.70	.72	.93	1.08	1.60	1.80	2.70	4.95

UNION TEES

MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

GASKETS EXTRA



WITH FEMALE UNION



WITH MALE UNION

Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
Price, with Female Union.....Each	.40	.43	.45	.57	.70	.95	1.15	1.70	3.20
Price, with Female Union, Galvanized, Each	.60	.65	.68	.86	1.05	1.45	1.75	2.55	4.80
Price, with Male Union..Each	.48	.50	.52	.65	.80	1.10	1.30	1.95	3.70
Price, with Male Union, Galvanized..Each	.72	.75	.78	1.00	1.20	1.65	1.95	2.95	5.55

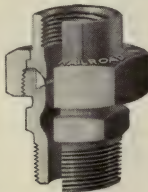
FOR BRASS TO IRON SEAT UNION ELBOWS AND TEES, SEE PAGES 370 AND 371  
FOR GENERAL DIMENSIONS, SEE PAGE 700

**RAILROAD UNION TEES****BRASS TO IRON SEAT**GROUND JOINT  
NON-CORROSIVENO GASKET REQUIRED  
READILY TAKEN APART**MALLEABLE IRON****FOR STEAM WORKING PRESSURES UP TO 200 POUNDS****TESTED TO 250 POUNDS HYDRAULIC PRESSURE**

OUR BRASS TO IRON SEAT RAILROAD UNION TEES HAVE BEEN EXAMINED AND TESTED BY THE UNDERWRITERS' LABORATORIES AND LISTED BY THE CONSULTING ENGINEERS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS.

**No. 598****WITH FEMALE UNION ON OUTLET**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 598.....Each	.70	.75	.82	.99	1.32	1.98
No. 598, Galvanized.....Each	.90	1.00	1.10	1.32	1.75	2.65

**BRASS TO IRON SEAT  
PUMP STUD UNIONS**GROUND JOINT  
NON-CORROSIVENO GASKET REQUIRED  
READILY TAKEN APART**MALLEABLE IRON****FOR STEAM WORKING PRESSURES UP TO 200 POUNDS****No. 517**

Size.....Inches	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$
No. 517.....Each	.90	1.20	1.80	2.40
No. 517, Galvanized.....Each	1.20	1.60	2.40	3.20

The male end is one pipe size larger than the female.



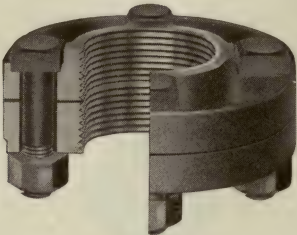
BRASS FLANGE UNIONS  
STANDARD

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

FACED

GASKET EXTRA

WITH IRON BOLTS



ROUGH

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	4.00	4.50	5.00	5.50	7.00	9.00
Diameter Flanges.....Inches	$2\frac{13}{16}$	$2\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{5}{8}$	$5\frac{1}{2}$
Nc. of Bolts.....	3	3	4	4	4	4
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price.....Each	11.50	15.00	18.00	22.00	35.00	45.00
Diameter Flanges.....Inches	6	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$9\frac{3}{8}$	$10\frac{5}{8}$
Number of Bolts.....	4	4	4	5	5	6

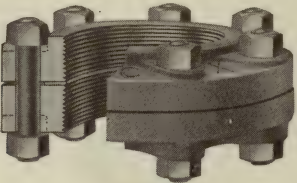
EXTRA HEAVY

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FACED

GASKET EXTRA

WITH IRON BOLTS



ROUGH

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	7.50	8.50	11.00	13.00	16.00	18.00
Diameter Flanges.....Inches	$3\frac{1}{4}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$	$5\frac{3}{8}$	6
Number of Bolts.....	4	4	4	4	5	5
Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price.....Each	24.00	27.00	30.00	37.00	48.00	60.00
Diameter Flanges.....Inches	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$8\frac{3}{4}$	$9\frac{3}{8}$	$10\frac{7}{8}$
Number of Bolts.....	6	6	7	8	8	9



## CAST IRON FLANGE UNIONS

### STANDARD

FOR STEAM WORKING PRESSURES UP TO  
125 POUNDS

FACED

GASKET EXTRA

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Each	.40	.46	.52	.64	.78	1.00	1.25
Price, Galvanized.....Each	.80	.92	1.04	1.28	1.56	2.00	2.50
Diameter of Flanges..Inches	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{1}{2}$	$5\frac{1}{8}$	$5\frac{7}{8}$
Number of Bolts.....	3	3	3	4	4	4	4
Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7
Price.....Each	1.50	1.80	2.10	2.70	3.15	3.95	5.50
Price, Galvanized.....Each	3.00	3.60	4.20	5.40	6.30	7.90	11.00
Diameter of Flanges..Inches	$6\frac{5}{8}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$8\frac{3}{8}$	$9\frac{1}{8}$	$10\frac{3}{8}$	$11\frac{5}{8}$
Number of Bolts.....	4	4	5	5	5	6	7
Size.....Inches	8	9	10	12	14	15	16
Price.....Each	7.00	10.00	11.50	16.00	28.00	35.00	60.00
Price, Galvanized.....Each	14.00	20.00	23.00	32.00	56.00	70.00	
Diameter of Flanges..Inches	$12\frac{3}{4}$	$13\frac{7}{8}$	$15\frac{1}{2}$	$17\frac{7}{8}$	$20\frac{5}{8}$	$20\frac{7}{8}$	23
Number of Bolts.....	8	9	10	12	14	14	16

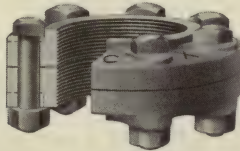
Sizes 14 inch and larger are to be used with O. D. pipe of the same sizes.

### EXTRA HEAVY

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FACED

GASKET EXTRA



No. 97 E

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.60	.70	.80	1.00	1.15	1.50
Diameter Flanges.....Inches	3	$3\frac{1}{4}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$	$5\frac{3}{8}$
Number of Bolts.....	3	4	4	4	4	5
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price.....Each	1.90	2.25	2.70	3.15	4.00	4.75
Diameter Flanges.....Inches	6	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$8\frac{3}{4}$	$9\frac{3}{8}$
Number of Bolts.....	5	6	6	7	8	8
Size.....Inches	6	7	8	9	10	12
Price.....Each	6.00	8.25	10.50	15.00	17.25	24.00
Diameter Flanges.....Inches	$10\frac{7}{8}$	12	$13\frac{1}{4}$	$14\frac{3}{8}$	$15\frac{3}{4}$	18
Number of Bolts.....	9	10	10	12	12	14

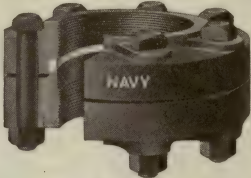
**CAST IRON  
FLANGE UNIONS  
NAVY  
EXTRA HEAVY**

**FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

**GROUND JOINT**

**BRASS TO IRON SEAT**

**NO GASKET REQUIRED**

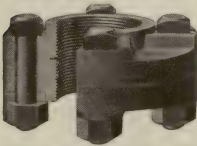


**No. 99 E**

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	.60	.80	1.20	1.60	2.00
Diameter Flanges.....Inches	$3\frac{1}{4}$	$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$	$5\frac{3}{8}$
Number of Bolts.....	4	4	4	4	5
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Price.....Each	3.20	4.80	6.00	7.50	8.75
Diameter Flanges.....Inches	6	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$8\frac{3}{4}$
Number of Bolts.....	5	6	6	7	8
Size.....Inches	5	6	7	8	10
Price.....Each	10.00	12.50	15.00	18.00	28.80
Diameter Flanges.....Inches	$9\frac{3}{8}$	$10\frac{7}{8}$	12	$13\frac{1}{4}$	$15\frac{3}{4}$
Number of Bolts.....	8	9	10	10	12

These Unions have found universal favor among the most experienced users and are strongly recommended as a superior article. The brass ring is forced into place by special machinery and cannot loosen.

The seats are ground in, so that a tight joint is obtained. The brass to iron seat eliminates the use of gaskets, and causes less trouble in making up pipe lines. New Unions are not needed when a joint is broken as the brass to iron seat makes it possible to use them again and again. Brass to brass seats will be made to order at special price. We can furnish these Unions to order, in larger sizes, made of Cast Iron, Ferrosteeel, Malleable Iron, Cast Steel or Forged Steel. The dimensions and style will be the same as our Extra Heavy Screwed Flanges. Prices on application.



**OIL COUNTRY PATTERN  
EXTRA HEAVY**

**NOT FACED**

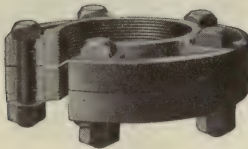
**GASKET EXTRA**

Size.....Inches	2
Price.....Each	1.50
Diameter Flanges.....Inches	$5\frac{9}{16}$
Number of Bolts.....	4

# MALLEABLE IRON FLANGE UNIONS

## STANDARD

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	1.40	1.60	2.00	2.50	3.00
Price, Galvanized.....Each	2.80	3.20	4.00	5.00	6.00
Diameter Flanges.....Inches	$2\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{5}{8}$	$5\frac{1}{2}$
Number of Bolts.....	3	4	4	4	4
Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Price.....Each	3.50	4.40	5.25	6.00	7.00
Price, Galvanized.....Each	7.00	8.80	10.50	12.00	14.00
Diameter Flanges.....Inches	6	$6\frac{3}{4}$	$7\frac{1}{2}$	8	$8\frac{5}{8}$
Number of Bolts.....	4	4	4	5	5
Size.....Inches	5	6	8		
Price.....Each	8.00	9.00	18.00		
Price, Galvanized.....Each	16.00	18.00	36.00		
Diameter Flanges.....Inches	$9\frac{3}{8}$	$10\frac{5}{8}$	$13\frac{1}{8}$		
Number of Bolts.....	5	6	7		

MALLEABLE IRON FLANGE UNIONS  
EXTRA HEAVY HYDRAULIC

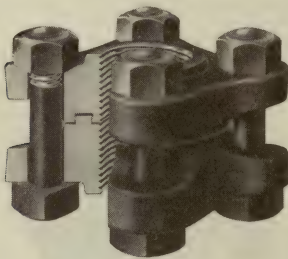
TONGUE AND GROOVE

WITH GASKET

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1/4 INCH TO 2 INCH, 2000 POUNDS HYDROSTATIC  
2 1/2 INCH TO 4 INCH, 1000 POUNDS HYDROSTATIC

THESE UNIONS ARE TESTED ON WATER TO THE HYDROSTATIC  
PRESSURES GIVEN ABOVE



No. 239 H

Size . . . . . Inches	1/4	3/8	1/2	3/4	1	1 1/4
Price . . . . . Each	1.35	1.35	1.50	1.50	1.50	1.75
Largest Outside Diameter . . Inches	3	3 3/8	3 1/2	3 3/8	3 7/8	4 1/2
Number of Bolts . . . . .	2	2	2	4	4	4
Size . . . . . Inches	1 1/2	2	2 1/2	3	3 1/2	4
Price . . . . . Each	2.25	3.00	6.00	9.00	11.50	14.00
Largest Outside Diameter . . Inches	5	5 3/4	6 3/4	7 7/8	8 7/8	9
Number of Bolts . . . . .	4	4	4	4	4	6

WORKING PRESSURES

These Unions are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

AIR OR GAS

Unions for Air or Gas are SPECIAL. See explanatory notes on page 153.

WHEN LARGER SIZE UNIONS ARE WANTED WE RECOMMEND OUR 251 H FERROSTEEL OR 251 D CAST STEEL COMPANION FLANGES WITH BOLTS AND GASKET. SEE PAGES 401 AND 393.

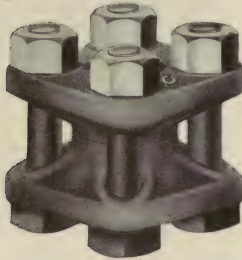


## STEEL FLANGE UNIONS

### DOUBLE EXTRA HEAVY HYDRAULIC

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS HYDROSTATIC

TESTED TO 6000 POUNDS HYDRAULIC PRESSURE



No. 330 D

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....Each	6.00	7.00	8.00	9.00	10.00	12.00

### WORKING PRESSURES

These Unions are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Unions for Air or Gas are SPECIAL. See explanatory notes on page 153.

## COMMON FLANGES

## CAST IRON

## NOT FACED



Size Inches	Price Each	Size Inches	Price Each	Size Inches	Price Each
$\frac{3}{4} \times 4$	.22	$4 \times 8\frac{1}{2}$	1.00	$7 \times 13\frac{1}{2}$	2.80
$1\frac{1}{4} \times 4\frac{1}{2}$	.25	$3 \times 9$	1.15	$8 \times 13\frac{1}{2}$	2.80
$\frac{3}{4} \times 5$	.30	$3\frac{1}{2} \times 9$	1.15	$6 \times 14$	3.25
$1 \times 5$	.30	$4 \times 9$	1.15	$7 \times 14$	3.25
$1\frac{1}{4} \times 5$	.30	$4\frac{1}{2} \times 9$	1.15	$8 \times 14$	3.25
$1\frac{1}{2} \times 5$	.30	$4\frac{1}{2} \times 9\frac{1}{4}$	1.25	$7 \times 15$	4.00
$1 \times 6$	.42	$3\frac{1}{2} \times 10$	1.50	$8 \times 15$	4.00
$1\frac{1}{4} \times 6$	.40	$4 \times 10$	1.50	$9 \times 15$	4.00
$1\frac{1}{2} \times 6$	.40	$4\frac{1}{2} \times 10$	1.50	$8 \times 16$	5.00
$2 \times 6$	.42	$5 \times 10$	1.50	$9 \times 16$	5.00
$2\frac{1}{2} \times 6$	.42	$6 \times 10$	1.50	$10 \times 16$	5.00
$2 \times 6\frac{1}{2}$	.50	$4\frac{1}{2} \times 11$	1.75	$9 \times 17$	5.75
$2\frac{1}{2} \times 6\frac{1}{2}$	.50	$5 \times 11$	1.75	$10 \times 17$	5.75
$3 \times 6\frac{1}{2}$	.50	$6 \times 11$	1.75	$10 \times 18$	7.00
$2 \times 7$	.62	$5 \times 12$	2.20	$12 \times 18$	7.00
$2\frac{1}{2} \times 7$	.62	$6 \times 12$	2.20	$10 \times 19$	7.50
$3 \times 7$	.62	$7 \times 12$	2.20	$12 \times 19$	7.50
$3 \times 7\frac{1}{2}$	.75	$5 \times 12\frac{1}{2}$	2.20	$12 \times 20$	8.50
$2 \times 8$	.90	$6 \times 12\frac{1}{2}$	2.20	$14 \times 20$	8.50
$2\frac{1}{2} \times 8$	.90	$7 \times 12\frac{1}{2}$	2.20	$14 \times 21$	9.50
$3 \times 8$	.90	$6 \times 13$	2.80	$15 \times 21$	9.50
$3\frac{1}{2} \times 8$	.90	$7 \times 13$	2.80	$15 \times 22\frac{1}{4}$	14.00
$4 \times 8$	.90	$8 \times 13$	2.80	$16 \times 23\frac{1}{2}$	18.00
$3\frac{1}{2} \times 8\frac{1}{2}$	1.00	$6 \times 13\frac{1}{2}$	2.80		

Sizes 14 inch and larger are to be used with O. D. Pipe of same sizes.

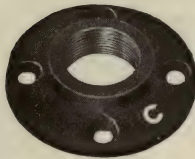
The above is considered a complete list. Other sizes made to order.

## FLOOR FLANGES

CAST IRON

COUNTERSUNK HOLES FOR SCREWS

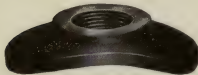
NOT FACED



Size.....Inches	$\frac{3}{8} \times 3$	$\frac{1}{2} \times 3\frac{1}{2}$	$\frac{3}{4} \times 3\frac{1}{2}$	$1 \times 4$	$1\frac{1}{4} \times 4$	$1\frac{1}{2} \times 4\frac{1}{2}$	$2 \times 5\frac{1}{2}$
Price.....Each	.10	.15	.15	.16	.16	.22	.35
Price, Galv. Each	.20	.30	.30	.32	.32	.44	.70

## CIRCULAR FLANGES

CAST IRON



Size of Pipe.....Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5
Diameter of Flange.....Inches	6	7	8	9	9	11
Size of Pipe.....Inches	6	7	8	9	10	12
Diameter of Flange.....Inches	12	13	14	17	18	20

These Flanges being made to order it is always necessary to give the circle they are to fit.

Patterns for Circular Flanges are so constructed that the bosses for pipe can be put on any size flange on the table above, thereby increasing the variety of sizes and diameters to meet the circumstance.

Prices on application.

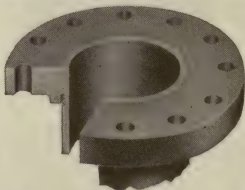
## COMPANION FLANGES

Our Companion Flanges conform to the American Standard for 125 and 250 pounds working pressures and should not be confused with flange unions, shown elsewhere in this catalogue, which are sold in pairs, are lighter than Companion Flanges, have smaller diameters and drilling templates, and lighter bolting so that they can not be bolted to flanged valves or flanged fittings.

We manufacture Companion Flanges of the following types: Screwed, Shrink, Cranelap, and Craneweld; of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel, and Forged Steel; except that the Craneweld is made of Forged Steel only.

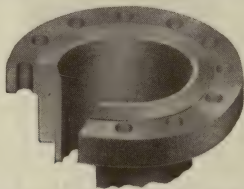
Our pipe shop is fully equipped with special machinery for flanging pipe with any of these types of flanges and we give below a brief description of the methods employed.

### SCREWED COMPANION FLANGES



The Screwed Flange is the least expensive of the several types and when properly made on the pipe it gives universal satisfaction for Standard and Medium steam working pressures. It is our practice to thread both the flange and the pipe accurately to the American Briggs gauge, after which, the flanges are screwed on by powerful machinery until the end of the pipe projects beyond the face of the flange, which insures a metal to metal joint. The end of the pipe is then cut off flush with the face of the flange and a light refacing cut taken across both the end of the pipe and the face of the flange, bringing the face of the flange at 90° with the center line of the pipe. When a flange applied and finished this way is bolted up, the gasket bears against the end of the pipe as well as the face of the flange.

### SHRINK COMPANION FLANGES



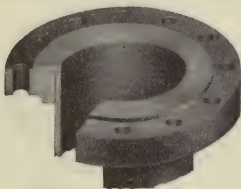
The Shrink Flange, previous to the introduction of the Lap and Weld types, was very popular for high pressure work because the thickness of the pipe was not reduced and the process of making on the pipe is comparatively simple. For this type of flange we true up the pipe, bore the flange to a shrink fit, and chamfer its bore. The flange is then heated to a red heat and while hot is slipped over the end of the pipe until the end of the pipe projects beyond the face of the flange.

(CONTINUED)

## COMPANION FLANGES — CONCLUDED

After the flange has partially cooled the end of the pipe is beaded into the chamfer and a light refacing cut is taken across both the end of the pipe and the face of the flange, bringing the face of the flange at  $90^{\circ}$  with the center line of the pipe. In a joint made with this type of flange the gasket bears against the end of the pipe as well as the face of the flange.

### CRANELAP COMPANION FLANGES



Our Cranelap Flange eliminates the defects of the ordinary lap joint. By the use of special machinery and a patented process we are able to make this with a square corner, which increases the amount of metal at the turn by about 75 per cent, and eliminates the water pocket always present in the old joint with round corners. The face of the flange is finished and the part of the face inside the bolt holes is finished to the same angle as the back side of the pipe which has been flanged over. The hub of the flange is bored slightly larger than the outside diameter of the pipe so that the flange will swivel readily and accommodate itself to any slight variation in the position of the bolt holes. The flanged portion of the pipe is finished on the edge and the face finished smooth.

### CRANEWELD COMPANION FLANGES



Our CraneWeld Flange is attached to the pipe by welding. The pipe and flange are heated to a welding heat, and the weld made by special machinery, which makes practically a hammer weld. The flange is then finished not only on the face, but also on the edge and back. This process gives an absolutely perfect union between the flange and the pipe, eliminating every possibility of leak between the flange and pipe. This joint should not be confused with that formed by the oxy-acetylene or similar processes, which do not always result in a perfect union between the flange and the pipe.

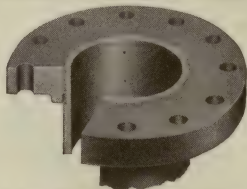


## FACING OF FLANGES

There are various styles of finish used on the face of flanges which have for their purpose the retention of the gasket used to make a tight joint. Those in general use are as follows:

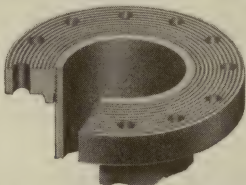
Plain Straight Face.  
Plain Face, Corrugated or Scored.  
Raised Face, Smooth Finish.  
Male and Female.  
Tongue and Groove.  
Double Male.

### PLAIN STRAIGHT FACE



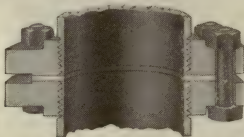
This type of facing has the entire face of the flange faced straight across and may be used with either a full face or ring gasket.

### PLAIN FACE, CORRUGATED OR SCORED



This style of facing is a plain straight face, upon which concentric grooves have been cut with either a round nose or "V" shaped tool. This finish is sometimes of advantage where the service demands an exceptionally thick, loosely woven fibrous or soft metallic gasket, because the roughening of the faces of the flanges tends to keep the gasket from blowing out.

### RAISED FACE, SMOOTH FINISH

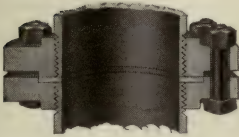


In this type of facing the portion of the face inside the bolt hole is finished smooth and  $\frac{1}{16}$  inch higher than the rest of the face. The raised faces keep the outside edges of the flanges from meeting when the bolts are drawn up extremely tight and it is possible to get a greater compression per square inch of gasket surface than with a plain face and full face gasket.

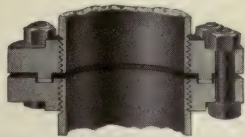
(CONTINUED)

## FACING OF FLANGES—CONTINUED

### MALE AND FEMALE AND TONGUE AND GROOVE



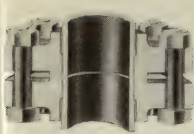
**MALE AND FEMALE FACES**



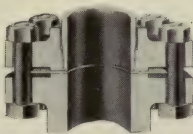
**TONGUED AND GROOVED FACES**

These facings have been extensively used, particularly on hydraulic lines, and to a more limited extent on high pressure steam lines. The Male and Female facing consists of a recess in one flange and a corresponding raised face or projection on the other, extending from the inside of the pipe nearly to the inside of the bolt holes. In the Tongue and Groove joint the tongue or raised face and the groove or recess are narrow rings located between the bolt holes and the port. Both of these types have, in common, several objectionable features. It is necessary that particular care be taken in facing each flange so that it will leave the shop either male or female as required to give proper mating when the material is erected. Frequently, through a misunderstanding between the shop and the customer, these facings are not furnished properly, which results in replacements, delays and inconvenience. Should a leak occur in a fitting furnished with either facing it is necessary to remove that fitting from the line to determine which flange was furnished male and which female, unless an accurate record has been kept. Further, if a fitting is to be replaced in a line it is necessary to spring the line apart to allow the fitting to be removed. These objections are all removed by the use of the following joint.

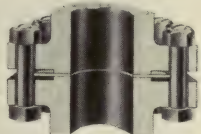
### DOUBLE MALE



**TWO COMPANION  
FLANGES**



**COMPANION FLANGE  
AND FITTING OR VALVE**



**TWO FITTINGS  
OR VALVES**

This style of facing is a high, narrow, raised ring, whose inside diameter is the same as that of the pipe or port. It is particularly recommended for all high pressure hydraulic lines. Gaskets used in this type of joint are either soft, fibrous material or soft metal and extend from the inside of the pipe to the bolt holes, and only the small portion in contact with the narrow raised face is subjected to the compressive effect of the bolts. This facing is superior to either the male and female or tongue and groove for the following reasons:

(CONTINUED)

## FACING OF FLANGES—CONCLUDED

It eliminates all mating of flanges, as they are all male.

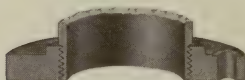
Any valve, fitting or piece of pipe may be removed from the line without springing the line apart.

The gasket is automatically centered by its outer edge coming in contact with the bolts.

The outside edges of the flanges are far enough apart to make it possible to determine whether the joint has been properly made.

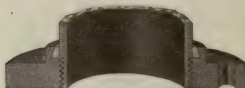
Where this type of facing is used on a valve, fitting or Craneweld flange, the projection is turned on the face of the flange. Where a screwed flange is used on Double Extra Strong pipe it is not always necessary to reface the flanges as the thickness of the pipe furnishes sufficient area for the gasket bearing. When Cranelap flanges are furnished double male, the outside diameters of the flanged over portion of the pipe are smaller than the regular Cranelap joint.

## SPOT FACED BOLT HOLES



For high pressure work, particularly where semi-finished bolts and nuts are used, it is desirable to have a better bearing surface for the bolts and nuts than can be obtained with rough castings. This is secured by finishing a bearing surface around each bolt hole on the back of the flange.

## CALKING RECESS FOR FLANGES



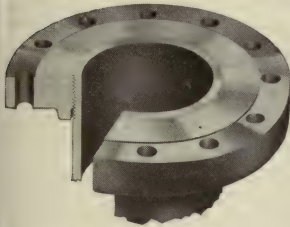
Calking recesses can be bored in extra heavy flanges in sizes 2 to 24 inch, inclusive. This recess will vary from  $\frac{3}{8}$  to  $\frac{1}{2}$  inch in depth, according to size, is  $\frac{1}{4}$  inch wide at the top and  $\frac{5}{16}$  inch at the bottom. For cold water lines these recesses are calked with lead; for steam lines with soft copper.

## CRANE FLANGED PIPE JOINTS

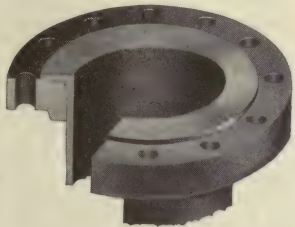
### COMPARISON OF PRICES

The following table shows the relative costs of the various types of Extra Heavy Flanges in Cast Iron, Malleable Iron, Ferrosteel, Cast Steel, and Forged Steel, using the Craneweld Forged Steel as a base.

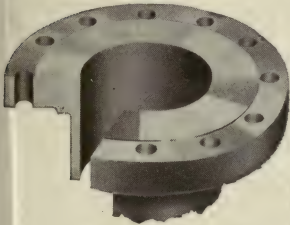
Our customers will find this ratio is approximately correct for all sizes. The figures given cover flanges made on pipe and refaced.



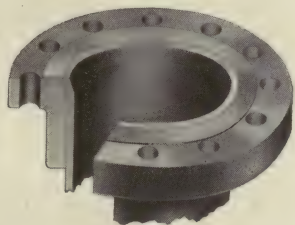
**SCREWED JOINT**



**CRANELAP JOINT**



**CRANEWELD JOINT**



**SHRUNK JOINT**

Extra Heavy Forged Steel Craneweld Flange.....	100%
Extra Heavy Forged Steel Shrink Flange.....	120%
Extra Heavy Cast Steel Shrink Flange.....	105%
Extra Heavy Ferrosteel Shrink Flange.....	70%
Extra Heavy Cast Iron Shrink Flange.....	60%
Extra Heavy Forged Steel Cranelap Flange.....	95%
Extra Heavy Cast Steel Cranelap Flange.....	75%
Extra Heavy Malleable Iron Cranelap Flange.....	55%
Extra Heavy Ferrosteel Cranelap Flange.....	53%
Extra Heavy Cast Iron Cranelap Flange.....	50%
Extra Heavy Forged Steel Screwed Flange.....	95%
Extra Heavy Cast Steel Screwed Flange.....	60%
Extra Heavy Malleable Iron Screwed Flange.....	45%
Extra Heavy Ferrosteel Screwed Flange.....	30%
Extra Heavy Cast Iron Screwed Flange.....	25%

For strength of materials, see pages B and C.



# STANDARD COMPANION FLANGES

## CAST IRON, FERROSTEEL, CAST STEEL, FORGED STEEL AND MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



BACK VIEW, SHOWING HUB

SMOOTH FACE

Size  Inches	No. 553 CAST IRON		No. 558 FERROSTEEL		No. 560 CAST STEEL		No. 556 FORGED STEEL		Threading Pipe, Making On and Refac- ing, not In- cluding Flange.
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	* Faced, Drilled and Spot Faced Each	Faced Each	Faced and Drilled Each	Net Each
1×4	.55	.80	.70	1.00	5.00	6.50			.40
1¼×4½	.60	.85	.75	1.05	5.40	7.00			.40
1½×5	.65	.90	.80	1.10	5.90	7.50			.45
2×6	.75	1.00	.95	1.25	6.90	8.50	10.40	11.00	.50
2½×7	.85	1.10	1.05	1.35	7.30	9.50	11.80	13.00	.55
3×7½	.95	1.25	1.20	1.55	8.70	11.00	13.70	15.00	.60
3½×8½	1.20	1.55	1.50	1.95	12.10	14.50	17.60	19.00	.65
4×9	1.35	1.80	1.70	2.25	14.80	18.50	18.30	20.00	.70
4½×9¼	1.45	1.90	1.80	2.35	15.80	19.50	20.30	22.00	.75
5×10	1.60	2.05	2.00	2.55	16.80	20.50	22.30	24.00	.85
6×11	2.00	2.50	2.50	3.10	20.40	24.00	25.40	27.00	1.00
7×12½	2.65	3.25	3.30	4.05	24.70	29.50	27.20	32.00	1.10
8×13½	3.10	3.80	3.90	4.75	27.00	32.00	32.00	35.00	1.30
9×15	3.85	4.65	4.80	5.80	29.50	35.50	37.00	40.00	1.55
10×16	4.50	5.50	5.65	6.85	34.50	40.50	45.00	48.00	1.70
12×19	6.50	7.65	8.15	9.55	46.00	53.00	56.00	60.00	2.40
14×21	9.00	10.35	11.25	13.00	55.50	63.00	75.50	80.00	3.10
15×21	11.50	13.20	14.50	16.50	64.00	74.00			3.10
15×22¼	11.50	13.20	14.50	16.50	64.00	74.00			3.25
16×23½	13.50	15.30	17.00	19.00	78.00	89.00			4.25
18×25	16.00	18.00	20.00	22.50	98.00	110.00			6.25
20×27½	19.00	21.50	24.00	27.00	117.00	130.00			7.50
22×29½	22.00	25.00	27.50	31.00	140.00	155.00			8.50
24×32	27.00	30.50	34.00	38.00	165.00	180.00			10.00

FOR MALLEABLE IRON FLANGES No. 559, USE DOUBLE THE LIST PRICES OF No. 553 CAST IRON FLANGES AND DISCOUNT APPLYING TO MALLEABLE IRON FLANGES.

Bolts per set for One Joint, see price list, page 390.

\*Cast Steel Flanges, when ordered faced and drilled, will always be furnished with bolt holes spot faced at the prices given above.

Furnished smooth faced and not drilled, unless otherwise specified. Standard Cast Steel Shrink Flanges made to order. Prices on application.

Special Eccentric Flanges, page 467.

For general dimensions, see page 715.

For drilling templates, see pages 650 and 651.

Prices for spot facing bolt holes, page 141.



# STANDARD REDUCING COMPANION FLANGES

CAST IRON

WITH RIBS

No. 557

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS ,



Size Inches	No. 557		Size Inches	No. 557		Size Inches	No. 557	
	Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each
1×6	1.30	1.55	4½×11	3.30	3.80	8×21	15.00	16.35
1¼×6	1.30	1.55	5×11	3.30	3.80	9×21	15.00	16.35
1½×6	1.30	1.55	4×12½	4.40	5.00	10×21	15.00	16.35
1½×7	1.45	1.70	4½×12½	4.40	5.00	12×21	15.00	16.35
2×7	1.45	1.70	5×12½	4.40	5.00	8×22¼	19.00	20.70
1½×7½	1.55	1.85	6×12½	4.40	5.00	10×22¼	19.00	20.70
2×7½	1.55	1.85	2×13½	5.10	5.80	12×22¼	19.00	20.70
2½×7½	1.55	1.85	2½×13½	5.10	5.80	14×22¼	19.00	20.70
2×8½	2.00	2.35	3×13½	5.10	5.80	10×23½	22.00	23.80
2½×8½	2.00	2.35	4×13½	5.10	5.80	12×23½	22.00	23.80
3×8½	2.00	2.35	5×13½	5.10	5.80	14×23½	22.00	23.80
2×9	2.20	2.65	6×13½	5.10	5.80	15×23½	22.00	23.80
2½×9	2.20	2.65	7×13½	5.10	5.80	12×25	26.50	28.50
3×9	2.20	2.65	6×15	6.35	7.15	14×25	26.50	28.50
3½×9	2.20	2.65	7×15	6.35	7.15	15×25	26.50	28.50
2½×9¼	2.40	2.85	8×15	6.35	7.15	16×25	26.50	28.50
3×9¼	2.40	2.85	2½×16	7.45	8.45	14×27½	31.00	33.50
3½×9¼	2.40	2.85	3×16	7.45	8.45	15×27½	31.00	33.50
4×9¼	2.40	2.85	3½×16	7.45	8.45	16×27½	31.00	33.50
2×10	2.65	3.10	4×16	7.45	8.45	18×27½	31.00	33.50
2½×10	2.65	3.10	5×16	7.45	8.45	15×29½	36.00	39.00
3×10	2.65	3.10	6×16	7.45	8.45	16×29½	36.00	39.00
3½×10	2.65	3.10	7×16	7.45	8.45	18×29½	36.00	39.00
4×10	2.65	3.10	8×16	7.45	8.45	20×29½	36.00	39.00
4½×10	2.65	3.10	9×16	7.45	8.45	14×32	44.00	47.50
2×11	3.30	3.80	6×19	10.75	11.90	16×32	44.00	47.50
2½×11	3.30	3.80	7×19	10.75	11.90	18×32	44.00	47.50
3×11	3.30	3.80	8×19	10.75	11.90	20×32	44.00	47.50
3½×11	3.30	3.80	9×19	10.75	11.90			
4×11	3.30	3.80	10×19	10.75	11.90			

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

When ordering, see Notes on page 770.

Bolts per set for One Joint, see price list, page 390.

Furnished smooth face and not drilled, unless otherwise specified.

Special Eccentric Flanges, page 467.

For general dimensions, see page 715.

For drilling templates, see page 650.

Prices for spot facing bolt holes, page 141.

## STANDARD CAST IRON BLIND FLANGES

No. 555



16 INCH O. D. AND SMALLER



19 INCH O. D. AND LARGER

Size of Valve or Fitting and O.D. of Flange Inches	Faced Each	Faced and Drilled Each	Bolts for One Joint Per Set	Size of Valve or Fitting and O.D. of Flange Inches	Faced Each	Faced and Drilled Each	Bolts for One Joint Per Set
1×4			.12	12×19	9.75	10.90	1.70
1¼×4½			.12	14×21	13.50	14.85	2.50
1½×5			.16	15×22¼	17.00	18.70	3.30
2×6	1.15	1.40	.25	16×23½	20.00	21.80	3.30
2½×7	1.30	1.55	.25	18×25	24.00	26.00	5.00
3×7½	1.40	1.70	.25	20×27½	28.00	30.50	6.20
3½×8½	1.80	2.15	.25	22×29½	33.00	36.00	8.40
4×9	2.00	2.45	.50	24×32	40.00	43.50	8.40
4½×9¼	2.20	2.65	.75	26×34¼	62.50	70.00	10.50
5×10	2.40	2.85	.75	28×36½	77.50	85.00	12.25
6×11	3.00	3.50	.75	30×38¾	90.00	100.00	21.00
7×12½	4.00	4.60	.75	32×41¾	110.00	120.00	26.00
8×13½	4.60	5.30	.80	34×43¾	122.50	135.00	30.00
9×15	5.75	6.55	1.20	36×46	137.50	150.00	31.00
10×16	6.75	7.75	1.60				

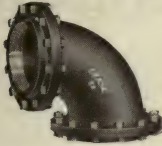
MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

Furnished smooth face and not drilled, unless otherwise specified.

For drilling templates, see page 650.

Prices for spot facing bolt holes, page 141.

**EXTRA NET PRICES FOR ATTACHING COMPANION  
FLANGES TO  
STANDARD AND LOW PRESSURE  
CAST IRON FLANGED FITTINGS AND VALVES**



**SHOWING  
COMPANION FLANGES  
BOLTED ON**



**SHOWING  
WOODEN FLANGE PRO-  
TECTORS BOLTED ON**

Size of Fitting or Valve	BOLTING COMPANION FLANGES TO FITTINGS NOT INCLUDING BOLTS OR GASKETS FOR LABOR ONLY		WOODEN PROTECTORS BOLTED ON WITH TWO BOLTS	
	Inches	Price for Each Flange		Price for Each Flange
	1¼	.10		.20
	1½	.10		.20
	2	.10		.20
	2½	.10		.20
	3	.10		.25
	3½	.10		.25
	4	.10		.25
	4½	.15		.25
	5	.15		.25
	6	.15		.25
	7	.15		.30
	8	.15		.30
	9	.20		.30
	10	.20		.35
	12	.20		.35
	14	.20		.40
	15	.25		.40
	16	.25		.45
	18	.25		.45
	20	.25		.50
	22	.25		.50
	24	.25		.50

Sizes above 24 inch, prices on application.

The above net prices apply to both Straight and Reducing Flanged Fittings, Flanges and Valves.

Gaskets will be furnished only when specified and at an extra price. See price list of Gaskets, pages 532 and 533.

For drilling templates, see page 650.

Price List for drilling, page 141.

## EXTRA HEAVY COMPANION FLANGES

Unless otherwise specified, we will always furnish our Extra Heavy Companion Flanges and Flanged Fittings, also our Extra Heavy and Medium Flanged Valves with  $\frac{1}{16}$  inch raised face, for which we make no extra charge.

This style of facing will hold any gasket, and is especially necessary where a thin corrugated copper gasket is used, as this gasket draws down to  $\frac{1}{32}$  inch or less and the heavy bolting would (without the raised face) spring the flanges until the edges touch, without putting sufficient pressure upon the gasket.

Extra Heavy Brass Flanged Fittings and Companion Flanges, are furnished with edge of flanges *finished and plain face*.

## MERITS OF CAST IRON THREAD JOINTS

We have made some tests to determine the holding value of Cast Iron Threads. These tests show that with a thread of half the standard depth of thread, the Flange will break before the thread will strip.

On a 10 inch flange, with six pipe threads engaged instead of the usual number, the flange broke at 950 pounds, but the threads were intact. Other tests made with pipe threads of half the usual length give similar results, so that the ordinary cast iron screw joint is sufficiently strong for **ANY STEAM PRESSURE CARRIED TODAY**, in view of the fact that the more threads there are the more bearing there is to overcome by friction and the more grit there likely will be to obstruct the making of a good joint, so that for ordinary purposes it is a question whether the manufacturers have not been providing considerable more bearing and threads than is desirable.

# EXTRA HEAVY COMPANION FLANGES

CAST IRON FERROSTEEL CAST STEEL FORGED STEEL  
AND MALLEABLE IRON

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



BACK VIEW, SHOWING HUB



RAISED FACE

Size	No. 151 E CAST IRON		No. 251 E FERROSTEEL		No. 281 D CAST STEEL		No. 291 E FORGED STEEL		Threading Pipe, Mak- ing on, and Refacing, not Incl'd- ing Flange Net Each
	Faced	Faced and Drill'd	Faced	Faced and Drill'd	Faced	* Faced, Drilled and Spot Faced	Faced	Faced and Drilled	
Inches	Each	Each	Each	Each	Each	Each	Each	Each	
1×4½	.95	1.30	1.20	1.65	5.00	6.50	7.50	8.00	.60
1¼×5	1.00	1.35	1.25	1.70	5.40	7.00	8.40	9.00	.60
1½×6	1.10	1.45	1.35	1.80	5.90	7.50	9.40	10.00	.65
2×6½	1.25	1.60	1.55	2.00	6.90	8.50	10.40	11.00	.70
2½×7½	1.40	1.75	1.75	2.20	7.30	9.50	11.80	13.00	.75
3×8¼	1.60	2.05	2.00	2.55	8.70	12.00	13.70	15.00	.85
3½×9	2.00	2.55	2.50	3.20	12.10	15.50	17.60	19.00	.90
4×10	2.25	2.95	2.80	3.70	14.80	18.50	18.30	20.00	.95
4½×10½	2.40	3.10	3.00	3.90	15.80	19.50	20.30	22.00	1.00
5×11	2.65	3.35	3.30	4.20	16.80	20.50	22.30	24.00	1.10
6×12½	3.30	4.05	4.10	5.05	20.40	25.00	25.40	27.00	1.25
7×14	4.40	5.30	5.50	6.60	24.70	30.50	27.20	32.00	1.35
8×15	5.10	6.15	6.40	7.70	27.00	33.00	32.00	35.00	1.55
9×16¼	6.30	7.50	7.90	9.40	29.50	35.50	37.00	40.00	1.80
10×17½	7.40	8.90	9.25	11.00	34.50	41.50	45.00	48.00	2.00
12×20½	10.75	12.50	13.50	15.50	46.00	54.00	56.00	60.00	2.75
14×23	15.00	17.00	18.50	21.00	55.50	65.00	75.50	80.00	3.50
15×24½	19.00	21.50	24.00	27.00	64.00	75.00	84.00	90.00	3.75
16×25½	22.25	25.00	28.00	31.00	78.00	90.00	93.00	100.00	4.75
18×28	26.00	29.00	32.50	36.00	98.00	111.00	118.00	125.00	7.00
20×30½	31.00	35.00	39.00	44.00	117.00	131.00	142.00	150.00	8.25
22×33	36.00	41.00	45.00	51.00	140.00	157.00			9.50
24×36	45.00	50.00	56.00	62.00	165.00	182.00			11.00

Furnished faced only, unless otherwise ordered.

FOR MALLEABLE IRON FLANGES (NO. 271 E) USE DOUBLE THE LIST PRICES  
OF NO. 151 E CAST IRON FLANGES AND THE DISCOUNT APPLYING TO MALLEABLE  
IRON FLANGES.

Bolts per set for one joint, see price list, page 396.

\*Cast Steel Flanges when ordered faced and drilled, will always be  
furnished with bolt holes spot faced, at the prices given above.

Special Eccentric Flanges, page 467.

For general dimensions, see page 716.

For drilling templates, see page 652.

Prices for spot facing bolt holes, page 152.



# EXTRA HEAVY REDUCING COMPANION FLANGES

CAST IRON

WITH RIBS

No. 155 E

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 155 E			No. 155 E			No. 155 E		
Size	Faced	Faced and Drilled	Size	Faced	Faced and Drilled	Size	Faced	Faced and Drilled
Inches	Each	Each	Inches	Each	Each	Inches	Each	Each
1¼×6	1.80	2.15	3×12½	5.50	6.25	10×20½	17.50	19.25
1½×6½	2.10	2.45	4×12½	5.50	6.25	8×23	25.00	27.00
1½×7½	2.30	2.65	4½×12½	5.50	6.25	9×23	25.00	27.00
2×7½	2.30	2.65	5×12½	5.50	6.25	10×23	25.00	27.00
1½×8¼	2.65	3.10	4½×14	7.25	8.15	12×23	25.00	27.00
2×8¼	2.65	3.10	5×14	7.25	8.15	8×24½	31.50	34.00
2½×8¼	2.65	3.10	6×14	7.25	8.15	10×24½	31.50	34.00
2×9	3.30	3.85	3×15	8.40	9.45	12×24½	31.50	34.00
2½×9	3.30	3.85	3½×15	8.40	9.45	14×24½	31.50	34.00
3×9	3.30	3.85	4×15	8.40	9.45	10×25½	37.00	39.75
2×10	3.70	4.40	5×15	8.40	9.45	12×25½	37.00	39.75
2½×10	3.70	4.40	6×15	8.40	9.45	14×25½	37.00	39.75
3×10	3.70	4.40	7×15	8.40	9.45	15×25½	37.00	39.75
3½×10	3.70	4.40	4×16¼	10.50	11.70	12×28	43.00	46.00
2×10½	4.00	4.70	5×16¼	10.50	11.70	14×28	43.00	46.00
2½×10½	4.00	4.70	6×16¼	10.50	11.70	15×28	43.00	46.00
3×10½	4.00	4.70	7×16¼	10.50	11.70	16×28	43.00	46.00
3½×10½	4.00	4.70	8×16¼	10.50	11.70	14×30½	51.00	55.00
4×10½	4.00	4.70	5×17½	12.00	13.50	15×30½	51.00	55.00
2×11	4.40	5.10	6×17½	12.00	13.50	16×30½	51.00	55.00
2½×11	4.40	5.10	7×17½	12.00	13.50	18×30½	51.00	55.00
3×11	4.40	5.10	8×17½	12.00	13.50	16×33	60.00	65.00
3½×11	4.40	5.10	9×17½	12.00	13.50	18×33	60.00	65.00
4×11	4.40	5.10	6×20½	17.50	19.25	20×33	60.00	65.00
4½×11	4.40	5.10	7×20½	17.50	19.25	18×36	74.00	79.00
2×12½	5.50	6.25	8×20½	17.50	19.25	20×36	74.00	79.00
2½×12½	5.50	6.25	9×20½	17.50	19.25			

When ordering, see notes on page 773.

Furnished faced only, unless otherwise ordered.

MADE TO ORDER OF FERROSTEEL (NO. 255 E), AT AN ADVANCE OF 25 PER CENT

Bolts per set for One Joint, see price list, page 396.

Special Eccentric Flanges, page 467.

For general dimensions, see page 716.

For drilling templates, see page 652.

Sizes 14 inch and larger are to be used with O. D. Pipe of the same sizes.

Prices for spot facing bolt holes, page 152.

# EXTRA HEAVY—REDUCING CAST STEEL COMPANION FLANGES WITH RIBS



No. 282 D

Size	Faced	* Faced, Drilled and Spot Faced	Size	Faced	* Faced, Drilled and Spot Faced	Size	Faced	* Faced, Drilled and Spot Faced
Inches	Each	Each	Inches	Each	Each	Inches	Each	Each
1½×7½	10.80	13.00	4×12½	30.90	35.50	10×20½	70.00	78.00
2×7½	10.80	13.00	4½×12½	30.90	35.50	8×23	85.00	95.00
1½×8¼	12.70	16.00	5×12½	30.90	35.50	9×23	85.00	95.00
2×8¼	12.70	16.00	4½×14	36.70	42.50	10×23	85.00	95.00
2½×8¼	12.70	16.00	5×14	36.70	42.50	12×23	85.00	95.00
2×9	18.10	21.50	6×14	36.70	42.50	8×24½	94.00	105.00
2½×9	18.10	21.50	3×15	40.00	46.00	10×24½	94.00	105.00
3×9	18.10	21.50	3½×15	40.00	46.00	12×24½	94.00	105.00
2×10	21.80	25.50	4×15	40.00	46.00	14×24½	94.00	105.00
2½×10	21.80	25.50	5×15	40.00	46.00	10×25½	115.00	127.00
3×10	21.80	25.50	6×15	40.00	46.00	12×25½	115.00	127.00
3½×10	21.80	25.50	7×15	40.00	46.00	14×25½	115.00	127.00
2×10½	23.80	27.50	4×16¼	44.00	50.00	15×25½	115.00	127.00
2½×10½	23.80	27.50	5×16¼	44.00	50.00	12×28	145.00	158.00
3×10½	23.80	27.50	6×16¼	44.00	50.00	14×28	145.00	158.00
3½×10½	23.80	27.50	7×16¼	44.00	50.00	15×28	145.00	158.00
4×10½	23.80	27.50	8×16¼	44.00	50.00	16×28	145.00	158.00
2×11	24.80	28.50	5×17½	52.00	59.00	14×30½	175.00	189.00
2½×11	24.80	28.50	6×17½	52.00	59.00	15×30½	175.00	189.00
3×11	24.80	28.50	7×17½	52.00	59.00	16×30½	175.00	189.00
3½×11	24.80	28.50	8×17½	52.00	59.00	18×30½	175.00	189.00
4×11	24.80	28.50	9×17½	52.00	59.00	16×33	210.00	227.00
4½×11	24.80	28.50	6×20½	70.00	78.00	18×33	210.00	227.00
2×12½	30.90	35.50	7×20½	70.00	78.00	20×33	210.00	227.00
2½×12½	30.90	35.50	8×20½	70.00	78.00	18×36	250.00	267.00
3×12½	30.90	35.50	9×20½	70.00	78.00	20×36	250.00	267.00

Bolts per set for One Joint, see price list, page 396.

\*Cast Steel Reducing Companion Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at the prices given above.

Special Eccentric Flanges, page 467.

In ordering Reducing Companion Flanges, see remarks and instructions, page 773.

For general dimensions, see page 716.

For drilling templates, see page 652.

## EXTRA HEAVY BLIND FLANGES

CAST IRON AND FERROSTEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



16 INCH O. D. AND SMALLER



17½ INCH O. D. AND LARGER

Size of Valve or Fitting and O. D. of Flange Inches	No. 153 E CAST IRON		No. 253 E FERROSTEEL		Bolts per set for one Joint
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	
1½×6	1.65	2.00	2.05	2.50	.25
2×6½	1.90	2.25	2.35	2.80	.25
2½×7½	2.10	2.45	2.60	3.05	.40
3×8¼	2.40	2.85	3.00	3.55	.80
3½×9	3.00	3.55	3.75	4.45	.80
4×10	3.35	4.05	4.20	5.10	.80
4½×10½	3.60	4.30	4.50	5.40	.80
5×11	4.00	4.70	5.00	5.90	.85
6×12½	5.00	5.75	6.25	7.20	1.25
7×14	6.60	7.50	8.25	9.35	1.70
8×15	7.65	8.70	9.60	10.90	1.80
9×16¼	9.50	10.70	11.90	13.40	2.60
10×17½	11.00	12.50	13.75	15.50	3.50
12×20½	16.00	17.75	20.00	22.00	5.15
14×23	22.50	24.50	28.00	30.50	6.70
15×24½	28.50	31.00	35.50	38.50	8.70
16×25½	33.50	36.25	42.00	45.00	8.70
18×28	39.00	42.00	48.50	52.00	10.80
20×30½	46.00	50.00	57.50	62.50	18.50
22×33	54.00	59.00	68.00	74.00	23.00
24×36	67.00	72.00	84.00	90.00	

Sizes 14 inch and larger are to be used with O. D. Pipe of the same sizes.  
Furnished faced only, unless otherwise ordered.

Special Eccentric Flanges, page 467.

For drilling templates, see page 652.

Prices for spot facing bolt holes, page 152.

# EXTRA HEAVY

## CAST STEEL BLIND FLANGES



No. 287 D



16 INCH O. D. AND SMALLER

17½ INCH O. D. AND LARGER

Size of Valve or Fitting and O. D. of Flange  Inches	Faced	* Faced, Drilled and Spot Faced
	Each	Each
2×6½	8.40	10.00
2½×7½	8.80	11.00
3×8¼	10.70	14.00
3½×9	14.60	18.00
4×10	18.30	22.00
4½×10½	19.80	23.50
5×11	20.80	24.50
6×12½	24.90	29.50
7×14	30.70	36.50
8×15	34.00	40.00
9×16¼	37.00	43.00
10×17½	52.00	59.00
12×20½	70.00	78.00
14×23	85.00	95.00
15×24½	94.00	105.00
16×25½	115.00	127.00
18×28	145.00	158.00
20×30½	175.00	189.00
22×33	210.00	227.00
24×36	250.00	267.00

Bolts per set for One Joint, see price list, page 396.

\*Cast Steel Blind Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at prices given above.

Special Eccentric Flanges, page 467.

For general dimensions, see page 716.

For drilling templates, see page 652.

# METHODS OF FACING EXTRA HEAVY COMPANION FLANGES

CAST IRON

FERROSTEEL

CAST STEEL

FORGED STEEL



RAISED FACE



MALE FACE



FEMALE FACE



SPOT FACED BOLT HOLES



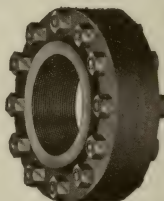
TONGUED FACE



GROOVED FACE



CALKING RECESS

SHOWING COMPANION FLANGES  
BOLTED TOGETHERSHOWING WOODEN FLANGE  
PROTECTOR BOLTED ON

NOTE.—Unless otherwise specified we will always furnish Extra Heavy Companion Flanges, with  $\frac{1}{16}$  inch raised face, without extra charge.  
Gaskets will be furnished only when specified and at an extra price. See price list for gaskets, pages 534 and 535.  
To avoid mistakes in facing flanges, furnish drawings.  
For dimensions of facings, see page 717.  
For drilling templates, see page 652.



# NET PRICE LIST FOR FACING EXTRA HEAVY COMPANION FLANGES

Size Inches	Extra for Male or Female Face Per Flange	Extra for Tongued or Grooved Face Per Flange	Extra for $\frac{1}{8}$ Inch Raised Face for Grinding Per Flange	Extra for Calking Recess Per Flange	Extra for Wooden Protectors, Bolted on with 2 Small Bolts, including the 2 Bolts Per Flange
1×4½	.50	.50	.50	.50	.20
1¼×5	.50	.50	.50	.50	.20
1½×6	.50	.50	.50	.50	.20
2×6½	.50	.50	.50	.50	.20
2½×7½	.65	.65	.65	.65	.20
3×8¼	.65	.65	.65	.65	.25
3½×9	.65	.65	.65	.65	.25
4×10	.65	.65	.65	.65	.25
4½×10½	.65	.65	.65	.65	.25
5×11	.65	.65	.65	.65	.25
6×12½	.80	.80	.80	.80	.25
7×14	.80	.80	.80	.80	.30
8×15	1.00	1.00	1.00	1.00	.30
9×16¼	1.00	1.00	1.00	1.00	.30
10×17½	1.00	1.00	1.00	1.00	.35
12×20½	1.25	1.25	1.25	1.25	.35
14×23	1.60	1.60	1.60	1.60	.40
15×24½	1.60	1.60	1.60	1.60	.40
16×25½	2.00	2.00	2.00	2.00	.45
18×28	2.50	2.50	2.50	2.50	.45
20×30½	3.00	3.00	3.00	3.00	.50
22×33	4.00	4.00	4.00	4.00	.50
24×36	5.00	5.00	5.00	5.00	.50

The prices given above apply to both straight and reducing sizes.

EXTRA HEAVY  
FLANGED VALVES AND FITTINGS

CAST IRON

FERROSTEEL

CAST STEEL

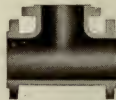
EXTRA NET PRICES FOR SPECIAL FACING, ETC.



ELBOW WITH  
FEMALE FLANGES



ELBOW WITH  
GROOVED FLANGES



TEE WITH  
MALE FLANGES



TEE WITH  
TONGUED FLANGES



COMPANION FLANGES  
BOLTED ON



WOODEN FLANGE PROTECTOR  
BOLTED ON

Size	MALE OR FEMALE, TONGUED OR GROOVED, OR RAISED FACE FOR GRINDING			BOLTING ON COMPANION FLANGES NOT INCLUDING BOLTS OR GASKETS FOR LABOR ONLY			FURNISHING AND BOLTING ON WOODEN PROTECTORS INCLUD- ING 2 BOLTS		
	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fitting with Four Flanges	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fitting with Four Flanges	Extra for Fitting or Valve with Two Flanges	Extra for Fitting or Valve with Three Flanges	Extra for Fit- ting with Four Flngs.
1 1/4 & 1 1/2	1.00	1.25	1.75	.20	.30	.40	.40	.60	.80
2	1.00	1.75	2.25	.20	.30	.40	.40	.60	.80
2 1/2	1.25	1.75	2.25	.20	.30	.40	.40	.60	.80
3 to 5	1.25	1.75	2.25	.30	.45	.60	.50	.75	1.00
6	1.50	2.00	2.50	.40	.60	.80	.50	.75	1.00
7	1.50	2.00	2.50	.40	.60	.80	.60	.90	1.20
8 and 9	2.00	2.50	3.00	.40	.60	.80	.60	.90	1.20
10	2.00	2.50	3.00	.40	.60	.80	.70	1.05	1.40
12	2.50	3.00	3.50	.50	.75	1.00	.70	1.05	1.40
14 & 15	3.25	4.00	5.00	.50	.75	1.00	.80	1.20	1.60
16	4.00	5.00	6.00	.50	.75	1.00	.90	1.35	1.80
18	5.00	6.25	7.50	.50	.75	1.00	.90	1.35	1.80
20	6.00	7.50	9.00	.50	.75	1.00	1.00	1.50	2.00
22	8.00	10.00	10.00	.50	.75	1.00	1.00	1.50	2.00
24	10.00	12.50	12.50	.50	.75	1.00	1.00	1.50	2.00

The above net prices apply to both straight and reducing sizes.

To avoid mistakes in facing flanges, furnish drawing.

Gaskets will be furnished only when specified and at an extra price.

Unless otherwise specified all flanges of Medium and Extra Heavy Valves and Fittings will be furnished with a raised face 1/8 inch high for which no extra charge will be made.

For dimensions of facings, see page 717. For drilling templates, see page 652.

Price List for drilling, page 152.

# EXTRA HEAVY HYDRAULIC COMPANION FLANGES

FERROSTEEL

MALE OR FEMALE

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
4½ TO 12 INCH, 800 LBS. HYDROSTATIC



No. 251 H

Size.....Inches	1½	2	2½	3	3½	4	4½
Faced .....Each	1.70	1.80	2.50	3.20	3.50	3.90	4.35
Faced and Drilled.....Each	1.85	2.00	2.75	3.50	3.85	4.25	4.75
Size.....Inches	5	6	7	8	9	10	12
Faced .....Each	4.60	6.50	7.50	8.40	10.25	13.00	20.00
Faced and Drilled.....Each	5.00	7.00	8.00	9.00	11.00	14.00	22.50

## WORKING PRESSURES

These Flanges are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Flanges for Air or Gas are SPECIAL. See explanatory notes on page 153.

In ordering, state whether Male or Female is wanted.

For general dimensions, see page 719.

Templates for drilling, page 653.

Price List for spot facing bolt holes, page 157.

**EXTRA HEAVY HYDRAULIC  
CAST STEEL COMPANION FLANGES**

**FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC**



No. 251 D

**PRICE LIST**

Size.....Inches	1½	2	2½	3	4	5	6
Faced.....Each	7.75	8.25	8.75	9.75	11.50	13.75	17.50
Faced, Drilled and Spot Faced	8.50	9.00	10.00	11.00	13.00	16.00	20.00

In ordering, state whether Male or Female Face is wanted.

**WORKING PRESSURES**

These Flanges are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are **NOT** recommended for these pressures. See explanatory notes on page 153.

**AIR OR GAS**

Flanges for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

Templates for drilling, page 654.

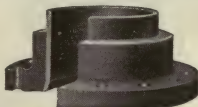
# EXTRA HEAVY SHRINK COMPANION FLANGES

## CAST IRON, FERROSTEEL, CAST STEEL AND FORGED STEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



FACED AND DRILLED  
BUT NOT BORED



FACED AND DRILLED  
AND SHRUNK ON PIPE

Size	No. 161 E CAST IRON		No. 261 E FERROSTEEL		No. 283 D CAST STEEL		No. 293 E FORGED STEEL		Bolts for one Joint
	Faced and Drilled, but not Bored	Boring, Shrink- ing on Pipe and Refac- ing, not includ- ing Flange	Faced and Drilled, but not Bored	Boring, Shrink- ing on Pipe and Refac- ing, not includ- ing Flange	* Faced, Drilled and Spot Faced, but not Bored	Boring, Shrink- ing on Pipe and Refac- ing, not includ- ing Flange	Faced and Drilled, but not Bored	Boring, Shrink- ing on Pipe and Refac- ing, not including Flange	
Inches	Each	Each	Each	Each	Each	Each	Each	Each	Per set
4×10	8.00	11.00	10.00	11.00	20.00	11.00			.80
4½×10½	9.00	11.00	11.25	11.00	22.00	11.00			.80
5×11	10.00	11.00	12.50	11.00	24.00	11.00			.85
6×12½	11.00	11.00	13.75	11.00	28.00	11.00	27.00	11.00	1.25
7×14	13.00	13.00	16.25	13.00	33.00	13.00	32.00	13.00	1.70
8×15	15.00	14.00	18.75	14.00	38.00	14.00	37.00	14.00	1.80
9×16½	17.00	15.00	21.25	15.00	43.00	15.00	42.00	15.00	2.60
10×17½	18.00	16.00	22.50	16.00	49.00	16.00	47.00	16.00	3.50
12×20½	24.00	16.00	30.00	16.00	59.00	16.00	65.00	16.00	5.15
14×23	29.00	16.00	36.00	16.00	75.00	16.00	80.00	16.00	6.70
15×24½	32.00	16.00	40.00	16.00	85.00	16.00	95.00	16.00	8.70
16×25½	36.00	17.00	45.00	17.00	95.00	17.00	105.00	17.00	8.70
18×28	42.00	19.00	52.50	19.00	116.00	19.00	125.00	19.00	10.80
20×30½	50.00	20.00	62.50	20.00	136.00	20.00	150.00	20.00	18.50
22×33	63.00	22.00	80.00	22.00	157.00	22.00			23.00
24×36	75.00	25.00	95.00	25.00	182.00	25.00			

\*Cast Steel Flanges, when ordered faced and drilled, will always be furnished with bolt holes spot faced at the prices given above.

Extra prices for special facing, bolting on and for wooden protectors, page 399.

Shrink Flanges with Bosses for bolt holes, prices on application.

For general dimensions, see page 718.

For drilling templates, see page 652.

Prices for spot facing bolt holes, page 152.

FOR FURTHER DESCRIPTION AND ILLUSTRATIONS OF PIPE JOINTS,  
SEE PAGES 384 TO 386

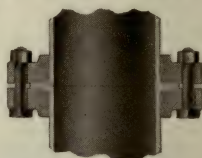
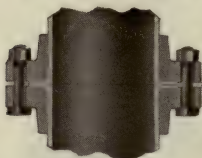


# EXTRA HEAVY CRANELAP FLANGED PIPE JOINTS

WITH SWIVEL FLANGES

PATENTED

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 181 E

FACED AND DRILLED, PLACED ON PIPE AND REFACED,  
PER FLANGE

Size	Cast Iron	Ferrosteel	Malleable Iron	Cast Steel	Forged Steel
Inches	Long Hub Each	Long Hub Each	Short Hub Each	Short Hub Spot Faced Each	Long Hub Each
4×10	19.00	21.00	23.00	31.00	31.00
4½×10½	20.00	22.25	24.50	33.00	33.00
5×11	21.00	23.50	26.00	35.00	35.00
6×12½	22.00	24.75	27.50	39.00	38.00
7×14	26.00	29.25	32.00	46.00	45.00
8×15	29.00	32.75	36.00	52.00	51.00
9×16¼	32.00	36.25	40.00	58.00	57.00
10×17½	34.00	38.50	43.00	65.00	63.00
12×20½	40.00	46.00	51.00	75.00	81.00
14×23	45.00	52.00	58.00	91.00	96.00
15×24½	48.00	56.00	62.00	101.00	111.00
16×25½	53.00	62.00	70.00	112.00	122.00
18×28	61.00	71.50	80.00	135.00	144.00
20×30½	70.00	82.50	95.00	156.00	170.00
22×33	85.00	102.00	115.00	179.00	
24×36	100.00	120.00	135.00	207.00	

We can furnish these joints made from any regular thickness of pipe; but, unless otherwise specified, 12 inch and smaller joints will be made from Standard Pipe, and the larger sizes from pipe which is ⅜ inch thick.

We are prepared to furnish the faces of these joints with a smooth, lathe finish ready for grinding to a ground joint.

When ordering Cranelap Joints, always state specifically the style and kind of metal that the flanges are to be made of.

\*Cast Steel Flanges, when ordered faced and drilled, will always be spot faced at the prices given above.

Bolts for Cranelap Joints will be proportionately longer than for other style joints; prices on application.

Extra prices for wooden protectors, etc., page 399.

For general dimensions, see page 718.

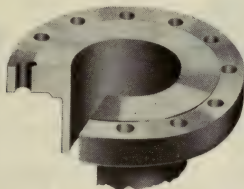
For drilling templates, see page 652.

FOR FURTHER DESCRIPTION AND ILLUSTRATIONS OF PIPE JOINTS,  
SEE PAGES 384 TO 386

# EXTRA HEAVY CRANEWELD FLANGED PIPE JOINTS

(FORGED STEEL FLANGE WELDED ON PIPE)

FOR SUPERHEATED STEAM WORKING PRESSURES UP TO 350 POUNDS AND  
A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT



No. 295 E

Size	Welded, Refaced, but not Drilled	Welded, Refaced and Drilled	Bolts for One Joint
Inches	Per End	Per End	Per Set
3½×9	13.25	14.00	.80
4×10	14.25	15.00	.80
4½×10½	14.75	15.50	.80
5×11	15.25	16.00	.85
6×12½	16.25	17.00	1.25
7×14	19.75	20.50	1.70
8×15	22.25	23.00	1.80
9×16¼	25.25	26.00	2.60
10×17½	31.00	32.00	3.50
12×20½	40.00	41.00	5.15
14×23	49.75	51.00	6.70
15×24½	58.75	60.00	8.70
16×25½	63.75	65.00	8.70
18×28	67.50	69.00	10.80
20×30½	70.50	72.00	18.50
22×33	83.00	85.00	23.00
24×36	101.00	103.00	

EXTRA PRICES FOR SPECIAL FACING, WOODEN PROTECTORS, ETC., PAGE 399

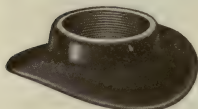
FOR GENERAL DIMENSIONS, SEE PAGE 718

FURTHER DESCRIPTION AND ILLUSTRATIONS OF PIPE JOINTS, PAGES 384 TO 386

FOR DRILLING TEMPLATES, SEE PAGE 652

## EXTRA HEAVY, FORGED STEEL SADDLE OR BOILER FLANGES

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 299 E



Size of Pipe Inches	Diameter of Flange Inches	Thickness of Flange Inches	Depth of Flange Inches	Price, Bent or Flat, not Threaded	Price, Bent or Flat, and Threaded
$\frac{3}{4}$	6	$\frac{5}{16}$	1	2.28	2.40
1	6	$\frac{5}{16}$	1	2.28	2.40
$1\frac{1}{4}$	$6\frac{1}{2}$	$\frac{5}{16}$	1	2.28	2.40
$1\frac{1}{2}$	7	$\frac{3}{8}$	$1\frac{1}{4}$	2.28	2.40
2	8	$\frac{3}{8}$	$1\frac{1}{2}$	2.35	2.50
$2\frac{1}{2}$	$8\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{2}$	2.45	2.60
3	9	$\frac{3}{8}$	$1\frac{1}{2}$	2.65	2.80
$3\frac{1}{2}$	$9\frac{1}{2}$	$\frac{7}{16}$	$1\frac{1}{2}$	3.00	3.20
4	10	$\frac{7}{16}$	2	3.35	3.50
$4\frac{1}{2}$	$10\frac{1}{2}$	$\frac{1}{2}$	2	4.00	4.20
5	$11\frac{1}{2}$	$\frac{1}{2}$	2	4.75	5.00
6	$12\frac{1}{2}$	$\frac{1}{2}$	2	5.70	6.00
7	14	$\frac{5}{8}$	$2\frac{1}{2}$	8.60	9.00
8	15	$\frac{5}{8}$	$2\frac{1}{2}$	11.40	12.00
9	$16\frac{1}{4}$	$\frac{3}{4}$	$2\frac{1}{2}$	27.00	30.00
10	$17\frac{1}{2}$	$\frac{3}{4}$	$2\frac{1}{2}$	32.00	35.00
12	20	$\frac{13}{16}$	$2\frac{1}{2}$	46.00	50.00

These Flanges have sufficient depth to permit bending them to any reasonable small diameter and still retain sufficient depth of thread to insure a perfectly tight joint.

Special Flanges less than 18 inch circle and up to 8 inch pipe, add 50 per cent. to the above list prices.

Flanges for 8 inch pipe bent to a circle less than 18 inches and not less than 10 inches, will be double the above list.

Flanges for 9, 10 and 12 inch pipe, when bent to less than 48 inch circle, and not less than 24 inch circle, add 50 per cent. to above list prices.

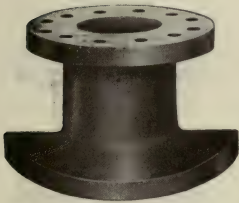
Flanges for 8 inch pipe and larger, when bent to circles less than those mentioned above, special prices will be quoted on receipt of specifications.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and size of rivets.

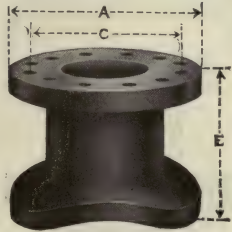
# STANDARD SADDLE NOZZLES

CAST IRON, FERROSTEEL OR CAST STEEL

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 552



## DIMENSIONS FOR SINGLE, DOUBLE OR STAGGERED RIVETING

Size of Nozzle.....Inches	2	2½	3	3½	4	4½	5
A—Diameter of Flat Flange.....Inches	6	7	7½	8½	9	9¼	10
Number of Bolts in Flat Flange.....	4	4	4	4	8	8	8
Size of Bolts.....Inches	⅝	⅝	⅝	⅝	⅝	¾	¾
C—Bolt Circle.....Inches	4¾	5½	6	7	7½	7¾	8½
E—Height, Face to Face.....Inches	7½	7½	7½	7½	7½	8	8
Smallest Diameter can be applied to.....Inches	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝
Size of Nozzle.....Inches	6	7	8	9	10	12	
A—Diameter of Flat Flange.....Inches	11	12½	13½	15	16	19	
Number of Bolts in Flat Flange.....	8	8	8	12	12	12	
Size of Bolts.....Inches	¾	¾	¾	¾	⅞	⅞	
C—Bolt Circle.....Inches	9½	10¾	11¾	13¼	14¼	17	
E—Height, Face to Face.....Inches	8½	9	9½	10	11	12	
Smallest Diameter can be applied to.....Inches	9⅝	10¾	12¾	14	15	16	

Orders and inquiries should state size of Saddle Nozzle, also the diameter of pipe or circle to which it is to be applied.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and the size of rivets.

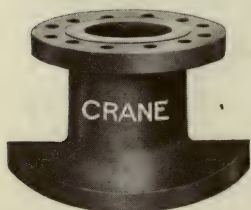
In order to facilitate drilling and riveting, the bottom flange is made oblong.

PRICES ON APPLICATION

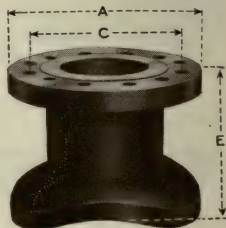
## EXTRA HEAVY FLANGED SADDLE NOZZLES

CAST IRON, FERROSTEEL OR CAST STEEL

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 149 E



### DIMENSIONS FOR SINGLE, DOUBLE OR STAGGERED RIVETING

Size of Nozzle..... Inches	2	2½	3	3½	4	4½	5	6	7	8
A—Diam. of Flat Flange. Inches	6½	7½	8¼	9	10	10½	11	12½	14	15
Number of Bolts in Flange.....	4	4	8	8	8	8	8	12	12	12
Size of Bolts..... Inches	⅝	¾	¾	¾	¾	¾	¾	¾	⅞	⅞
C—Bolt Circle..... Inches	5	5⅞	6⅝	7¼	7⅞	8½	9¼	10⅜	11⅞	13
E—Height, Face to Face. Inches	7½	7½	7½	7½	7½	8	8	8½	9	9½
Smallest Diameter can be Applied to. . Inches	8⅝	8⅝	8⅝	9⅝	10¾	12¾	14	14	15	16
Size of Nozzle..... Inches	9	10	12	14	15	16	18	20	22	24
A—Diam. of Flat Flange. Inches	16¼	17½	20½	23	24½	25½	28	30½	33	36
Number of Bolts in Flange.....	12	16	16	20	20	20	24	24	24	24
Size of Bolts..... Inches	1	1	1⅞	1⅞	1¼	1¼	1¼	1⅞	1½	1⅞
C—Bolt Circle..... Inches	14	15¼	17¾	20¼	21½	22½	24¾	27	29¼	32
E—Height, Face to Face. Inches	10	11	12	13	13	13½	14	15	15½	16
Smallest Diameter can be Applied to. . Inches	18	18	20	24	24	26	30	32	36	36

Orders and inquiries should state size of Saddle Nozzles, also the diameter of pipe or circle to which it is to be applied.

Also specify whether wanted drilled for single, double or staggered riveting, giving pitch, spacing and the size of rivets.

When Nozzles are wanted to comply with Marine requirements, orders should so state.

In order to facilitate drilling and riveting, the bottom flange is made oblong.

PRICES ON APPLICATION



# STANDARD BRASS FLANGED FITTINGS AND COMPANION FLANGES

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

Standard Brass Flanged Fittings and Companion Flanges are furnished with edge of Flanges Finished. Large Orders can be furnished with edge of Flanges Rough at a reduction in price.



FLANGED ELBOWS



FLANGED TEES

Size Inches	ELBOWS		45° ELBOWS		TEES		CROSSES	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	25.00	26.00	27.50	28.50	37.50	39.00	50.00	52.00
2½	33.75	35.00	37.25	38.50	50.75	52.50	67.50	70.00
3	43.75	45.00	47.75	49.00	65.75	67.50	87.50	90.00
3½	58.75	60.00	63.75	65.00	88.25	90.00	117.50	120.00
4	68.00	70.00	73.00	75.00	102.00	105.00	136.00	140.00
4½	78.00	80.00	83.00	85.00	117.00	120.00	156.00	160.00
5	93.00	95.00	98.00	100.00	137.00	140.00	186.00	190.00
6	123.00	125.00	133.00	135.00	187.00	190.00	246.00	250.00

Reducing Brass Flanged Fittings made to order. Prices on application.

## SCR'D COMP. FLGS.

## DIMENSIONS OF FITTINGS AND FLANGES

Size Inches	Faced Each	Faced and Drill- ed Each	Size Ins.	Face to Face Ins.	Cent'r to Face Ins.	C.to F. 45° El- bows Ins.	Diam. of Flan- ges Ins.	Thi'k- ness of Flgs. Ins.	Num- ber of Bolts	Size and Length of Bolts Inches	Bolt Circle Ins.
1×4	5.75	6.00					4	¾	4	7/16×1¼	3
1½×4½	6.75	7.00					4½	¾	4	7/16×1½	3¾
1½×5	8.75	9.00					5	7/16	4	½×1½	3¾
2×6	10.75	11.00	2	9	4½	2½	6	½	4	5/8×1¾	4¾
2½×7	12.50	13.00	2½	10	5	3	7	9/16	4	5/8×2	5½
3×7½	15.50	16.00	3	11	5½	3	7½	5/8	4	5/8×2	6
3½×8½	19.25	20.00	3½	12	6	3½	8½	11/16	4	5/8×2¼	7
4×9	24.25	25.00	4	13	6½	4	9	11/16	8	5/8×2¼	7½
4½×9½	26.75	27.50	4½	14	7	4	9¼	3/4	8	¾×2½	7¾
5×10	29.00	30.00	5	15	7½	4½	10	¾	8	¾×2½	8½
6×11	36.50	37.50	6	16	8	5	11	13/16	8	¾×2¾	9½

The diameter and thickness of Standard Brass Companion Flanges are the same as the flanges on Flanged Fittings, as given in above table. Prices and dimensions of Brass Flanged Fittings, sizes smaller than 2 inch, will be furnished on application.

## EXTRA HEAVY BRASS FLANGED FITTINGS

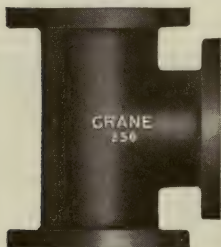
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



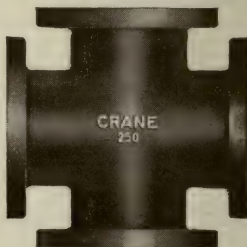
**FLANGED ELBOWS**



**45° FLANGED ELBOWS**



**FLANGED TEES**



**FLANGED CROSSES**

### DIMENSIONS AND TEMPLATES FOR DRILLING

Size Ins.	Face to Face Ins.	Center to Face Inches	C. to F. 45° Elbows Inches	Diam. of Flanges Inches	Thick- ness of Flanges Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches	Bolt Circle Inches
1	8	4	2	4½	½	4	½	1¾	3¼
1¼	8½	4¼	2½	5	¾	4	½	1¾	3¾
1½	9	4½	2¾	6	¾	4	¾	2	4½
2	10	5	3	6½	¾	4	¾	2	5
2½	11	5½	3½	7½	1	4	¾	2¼	5¾
3	12	6	3½	8¼	¾	8	¾	2½	6½
3½	13	6½	4	9	1	8	¾	2¾	7¼
4	14	7	4½	10	1	8	¾	2¾	7¾
4½	15	7½	4½	10½	1	8	¾	2¾	8½
5	16	8	5	11	1	8	¾	3	9¼
6	17	8½	5½	12½	1	12	¾	3	10½

The diameter and thickness of Extra Heavy Brass Companion Flanges, are the same as given in above table.

Flanged Fittings are drilled in multiples of four, so that they may be made to face in any quarter and bolt holes straddle center line.

Unless otherwise specified, we will always furnish our Extra Heavy Brass Flanged Fittings and Companion Flanges with plain face.

When coupled with Extra Heavy Iron Flanges, Valves or Fittings, the iron fittings or valves should be ordered without the raised face.

## EXTRA HEAVY BRASS FLANGED FITTINGS AND COMPANION FLANGES

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

ILLUSTRATIONS AND DIMENSIONS ON OPPOSITE PAGE

### PRICE LIST

Size Ins.	ELBOWS		45° ELBOWS		TEES	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1	13.00	14.00	14.00	15.00	19.50	21.00
1¼	15.00	16.00	16.00	17.00	22.50	24.00
1½	20.00	21.00	22.00	23.00	30.00	31.50
2	25.00	26.00	27.50	28.50	37.50	39.00
2½	33.75	35.00	37.25	38.50	50.75	52.50
3	43.75	45.00	47.75	49.00	65.75	67.50
3½	58.75	60.00	63.75	65.00	88.25	90.00
4	68.00	70.00	73.00	75.00	102.00	105.00
4½	78.00	80.00	83.00	85.00	117.00	120.00
5	93.00	95.00	98.00	100.00	137.00	140.00
6	123.00	125.00	133.00	135.00	187.00	190.00

### PRICE LIST

Size Inches	CROSSES		SCREWED COMP. FLANGES		
	Faced Each	Faced and Drilled Each	Size Inches	Faced Each	Faced and Drilled Each
1	26.00	28.00	1×4½	5.75	6.00
1¼	30.00	32.00	1¼×5	6.75	7.00
1½	40.00	42.00	1½×6	8.75	9.00
2	50.00	52.00	2×6½	10.75	11.00
2½	67.50	70.00	2½×7½	12.50	13.00
3	87.50	90.00	3×8¼	15.50	16.00
3½	117.50	120.00	3½×9	19.25	20.00
4	136.00	140.00	4×10	24.25	25.00
4½	156.00	160.00	4½×10½	26.75	27.50
5	186.00	190.00	5×11	29.00	30.00
6	246.00	250.00	6×12½	36.50	37.50

Extra Heavy Brass Flanged Fittings and Companion Flanges, are furnished with edge of flanges *finished*.

Reducing Brass Flanged Fittings made to order. Prices on application.

We will make to order at a special price, Extra Heavy Brass Flanged Fittings from any of our Extra Heavy Cast Iron Patterns, as shown pages 438 to 450.

**LOW PRESSURE**  
**CAST IRON FLANGED FITTINGS**

**FOR STEAM WORKING PRESSURES UP TO 25 POUNDS**

**FOR WATER WORKING PRESSURES, SEE PAGE A**

**LOW PRESSURE CAST IRON FLANGED FITTINGS ARE**  
**MARKED CRANE 25**

All Low Pressure Flanged Fittings have the same dimensions as Standard Flanged Fittings, except the thickness of body.

For further information, see page 419.

# LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED ELBOWS**

**No. 567**



**45° FLANGED ELBOWS**

**No. 569**

Size  Inches	No. 567		No. 569	
	Faced	Faced and Drilled	Faced	Faced and Drilled
	Each	Each	Each	Each
16	52.00	57.00	52.00	57.00
18	67.50	73.50	67.50	73.50
20	85.50	92.50	85.50	92.50
22	107.00	116.00	107.00	116.00
24	133.00	143.00	133.00	143.00
26	167.50	180.00	167.50	180.00
28	190.00	210.00	190.00	210.00
30	225.00	245.00	225.00	245.00
32	270.00	290.00	270.00	290.00
34	315.00	340.00	315.00	340.00
36	360.00	385.00	360.00	385.00

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.



## LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED  
SQUARE BASE ELBOWS**  
No. 579



**FLANGED  
ROUND BASE ELBOWS**  
No. 580

Size  Inches	No. 579 or No. 580		
	Faced Except Base Flange	Faced and Drilled Except Base Flange	Facing and Drilling Base Flange
	Each	Each	Each
16	85.00	90.00	7.50
18	100.00	106.00	12.00
20	114.00	121.00	12.00
22	142.00	151.00	12.00
24	180.00	190.00	12.00

Prices of Fittings larger than 24 inch, on application.

**FLANGED BASE TEES MADE TO ORDER. PRICES ON APPLICATION**  
Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

# LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED LONG RADIUS ELBOWS**  
**No. 578**

Size Inches	No. 578		Radius
	Faced Each	Faced and Drilled Each	Inches
16	86.00	93.50	21 $\frac{1}{4}$
18	113.00	122.00	23 $\frac{5}{8}$
20	143.00	153.00	26
22	178.00	191.00	28 $\frac{3}{8}$
24	222.00	237.00	30 $\frac{3}{4}$

Long Radius Elbows of different dimensions from above, made to order at a special price.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

## LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED TEES**

**No. 571**



**REDUCING FLANGED TEES  
REDUCING IN RUN OR BRANCH**

**No. 573**

Size  Inches	No. 571		No. 573	
	Faced	Faced and Drilled	Faced	Faced and Drilled
	Each	Each	Each	Each
16	75.00	82.50	86.00	93.50
18	98.00	107.00	113.00	122.00
20	123.00	133.00	143.00	153.00
22	155.00	168.00	178.00	191.00
24	193.00	208.00	222.00	237.00
26	243.00	262.00	280.00	299.00
28	275.00	305.00	316.00	346.00
30	325.00	355.00	375.00	405.00
32	392.00	422.00	451.00	481.00
34	457.00	495.00	525.00	563.00
36	520.00	560.00	598.00	638.00

Reducing Low Pressure Tees made to order in all reducing sizes at regular list and discount.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

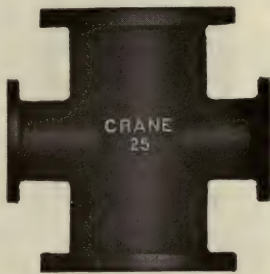
For drilling templates, see pages 650 and 651.

## LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED CROSSES**  
**No. 575**



**REDUCING FLANGED CROSSES**  
**No. 577**

Size  Inches	No. 575		No. 577	
	Faced	Faced and Drilled	Faced	Faced and Drilled
	Each	Each	Each	Each
16	114.00	124.00	130.00	140.00
18	150.00	162.00	172.00	184.00
20	188.00	202.00	217.00	231.00
22	235.00	253.00	270.00	288.00
24	290.00	310.00	335.00	355.00
26	370.00	395.00	425.00	450.00
28	420.00	460.00	480.00	520.00
30	495.00	535.00	565.00	605.00
32	595.00	635.00	685.00	725.00
34	690.00	740.00	795.00	845.00
36	790.00	840.00	910.00	960.00

Reducing Low Pressure Crosses made to order in all reducing sizes at regular list and discount.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

## LOW PRESSURE CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 25 POUNDS



**FLANGED  
TAPER REDUCERS  
No. 581**



**FLANGED ECCENTRIC  
TAPER REDUCERS  
No. 582**

Size Inches	No. 581		Size Inches	Size Inches
	Faced Only	Faced and Drilled		
16×12	85.00	90.00	26×24	38×34
16×14	85.00	90.00	28×20	38×36
16×15	85.00	90.00	28×22	40×32
18×12	100.00	106.00	28×24	40×34
18×14	100.00	106.00	28×26	40×36
18×15	100.00	106.00	30×22	40×38
18×16	100.00	106.00	30×24	42×34
20×14	114.00	121.00	30×26	42×36
20×15	114.00	121.00	30×28	42×38
20×16	114.00	121.00	32×24	42×40
20×18	114.00	121.00	32×26	44×36
22×15	142.00	151.00	32×28	44×38
22×16	142.00	151.00	32×30	44×40
22×18	142.00	151.00	34×26	44×42
22×20	142.00	151.00	34×28	46×38
24×16	180.00	190.00	34×30	46×40
24×18	180.00	190.00	34×32	46×42
24×20	180.00	190.00	36×28	46×44
24×22	180.00	190.00	36×30	48×40
26×18			36×32	48×42
26×20			36×34	48×44
26×22			38×30	48×46
			38×32	

For general dimensions, see pages 702 to 705.

Templates for drilling, pages 650 and 651.

Flanged Eccentric Taper Reducers will be made to order only.

Flanged Taper Reducers not listed above, will be made to order.



## STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Standard Reducing Elbows carry same dimensions center to face as regular Elbows of largest straight size.

Standard Tees, Crosses and Laterals, reducing on run only, carry same dimensions face to face as largest straight size.

Where long radius fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

All standard weight fittings are recommended for steam working pressure up to 125 pounds, and are marked **CRANE** For water working pressures, see page A.  
125

All standard weight fittings and flanges have plain faces.

Bolt holes drilled  $\frac{1}{8}$  inch larger in diameter than diameter of bolts.

Bolt holes will not be spot faced unless so ordered, for which an extra charge will be made.

Bolt holes straddle center line.

Size of all fittings scheduled indicates inside diameter of ports.

The face to face dimension of Reducers, either straight or eccentric, is the same face to face as given in table of dimensions.

Square head bolts with hexagonal nuts are recommended.

For bolts,  $1\frac{5}{8}$  inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal nuts for pipe sizes 1 inch to 46 inches, can be conveniently pulled up with open wrenches of minimum design of heads. Hexagonal nuts for pipe sizes 48 inches to 100 inches on 125 pound, can be conveniently pulled up with box wrenches.

Double Branch Elbows, whether straight or reducing, carry same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry same dimensions center to face and face to face as regular Tees having same reductions.

Bull Head Tees or Tees increasing on outlet, will have same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Tees, Crosses and Laterals, 16 inches and down, reducing on the outlet or branch, use the same dimensions as straight sizes of the larger port.

Size 18 inches and up, fittings reducing on the outlet or branch are made in two lengths, depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings are always regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

"Y's" are special and are made to suit conditions.

Double Sweep Tees are not made reducing on the run.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED ELBOWS**  
**No. 525**



**45° FLANGED ELBOWS**  
**No. 527**

Size Inches	No. 525		No. 527	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	3.00	3.60	3.30	3.90
1½	3.00	3.60	3.30	3.90
2	3.00	3.60	3.30	3.90
2½	3.15	3.75	3.50	4.10
3	3.45	4.15	3.80	4.50
3½	4.05	4.90	4.50	5.35
4	4.50	5.50	5.00	6.00
4½	5.50	6.50	6.00	7.00
5	6.25	7.25	6.90	7.90
6	7.60	8.90	8.35	9.65
7	10.50	12.00	11.00	12.50
8	12.00	13.60	12.60	14.20
9	17.00	19.25	17.75	20.00
10	19.00	21.70	20.00	22.70
12	28.00	31.00	29.50	32.50
14	41.50	45.25	41.50	45.25
15	47.00	51.50	47.00	51.50
16	54.50	59.50	54.50	59.50
18	71.00	77.00	71.00	77.00
20	90.00	97.00	90.00	97.00
22	113.00	122.00	113.00	122.00
24	140.00	150.00	140.00	150.00

Larger sizes made to order. Prices on application.  
Furnished faced only, unless otherwise ordered.  
For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.

**STANDARD**  
**CAST IRON FLANGED FITTINGS**  
 FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED  
 SQUARE BASE ELBOWS**  
 No. 549



**FLANGED  
 ROUND BASE ELBOWS**  
 No. 550

Size  Inches	No. 549 or No. 550		
	Faced Except Base Flange	Faced and Drilled Except Base Flange	Facing and Drilling Base Flange
	Each	Each	Each
4	9.00	10.00	3.00
4½	11.00	12.00	3.00
5	12.50	13.50	3.50
6	15.25	16.55	3.50
7	21.00	22.50	3.50
8	24.00	25.60	5.00
9	34.00	36.25	5.00
10	38.00	40.70	5.00
12	56.00	59.00	7.50
14	70.00	73.75	7.50
15	80.00	84.50	7.50
16	90.00	95.00	7.50
18	105.00	111.00	12.00

**FLANGED BASE TEES MADE TO ORDER. PRICES ON APPLICATION**

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

**STANDARD**  
**CAST IRON FLANGED FITTINGS**  
 FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED LONG RADIUS ELBOWS**  
**No. 551**

Size  Inches	No. 551		Radius  Inches
	Faced  Each	Faced and Drilled  Each	
2	5.00	5.90	5¼
2½	5.25	6.15	5⅝
3	5.75	6.85	6¼
3½	6.75	8.00	6⅞
4	7.50	9.00	7⅞
4½	9.25	10.75	7¾
5	10.50	12.00	8½
6	12.65	14.60	9⅝
7	17.50	19.75	10⅞
8	20.00	22.40	12
9	28.50	31.85	13
10	31.50	35.50	14⅞
12	46.50	51.00	16½
14	69.00	74.50	18⅞
15	78.00	84.75	20
16	91.00	98.50	21¼
18	118.00	127.00	23⅞
20	150.00	160.00	26

Long Radius Elbows of different dimensions from above, made to order at a special price.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED REDUCING TAPER ELBOWS**  
**No. 545**

Size Inches	No. 545		Size Inches	No. 545	
	Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each
3×1½	6.90	7.60	8×6	24.00	25.60
3×2	6.90	7.60	8×7	24.00	25.60
3×2½	6.90	7.60	9×6	34.00	36.25
3½×2	8.10	8.95	9×8	34.00	36.25
3½×2½	8.10	8.95	10×4½	38.00	40.70
3½×3	8.10	8.95	10×5	38.00	40.70
4×2	9.00	10.00	10×6	38.00	40.70
4×2½	9.00	10.00	10×7	38.00	40.70
4×3	9.00	10.00	10×8	38.00	40.70
4×3½	9.00	10.00	10×9	38.00	40.70
4½×2½	11.00	12.00	12×6	56.00	59.00
4½×3½	11.00	12.00	12×7	56.00	59.00
4½×4	11.00	12.00	12×8	56.00	59.00
5×2½	12.50	13.50	12×10	56.00	59.00
5×3	12.50	13.50	14×10	70.00	73.75
5×4	12.50	13.50	14×12	70.00	73.75
6×2½	15.25	16.55	15×10	80.00	84.50
6×3	15.25	16.55	15×12	80.00	84.50
6×3½	15.25	16.55	16×12	90.00	95.00
6×4	15.25	16.55	16×14	90.00	95.00
6×5	15.25	16.55	16×15	90.00	95.00
7×5	21.00	22.50	18×15	105.00	111.00
7×6	21.00	22.50	18×16	105.00	111.00
8×3½	24.00	25.60	20×14	120.00	127.00
8×4	24.00	25.60	20×16	120.00	127.00
8×5	24.00	25.60	20×18	120.00	127.00

Flanged Taper Reducing Elbows not listed above will be made to order at a special price.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.



# STANDARD

## CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED  
DOUBLE BRANCH ELBOWS  
No. 538**



**REDUCING DOUBLE  
BRANCH FLANGED ELBOWS  
No. 540**

Size  Inches	No. 538		No. 540	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	28.50	30.00	31.50	33.00
5	36.00	37.50	39.50	41.00
6	38.00	40.00	42.00	44.00
7	42.75	45.00	47.75	50.00
8	47.50	50.00	52.50	55.00
10	66.00	70.00	73.50	77.50
12	90.50	95.00	100.50	105.00
14	119.50	125.00	132.50	138.00
16	142.50	150.00	157.50	165.00

Lists given above for No. 540 are for Fittings reducing on the branches with branches same size. If Fittings are wanted with branches two different sizes or reducing on inlet they will be made to order at a special price.

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

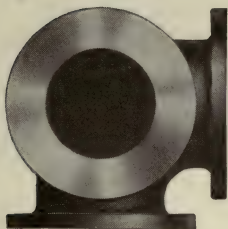
For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

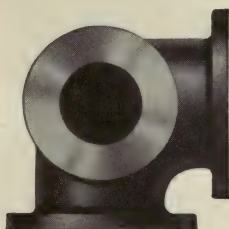
## STANDARD

### CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED  
SIDE OUTLET ELBOWS  
No. 526**



**REDUCING SIDE  
OUTLET FLANGED ELBOWS  
No. 528**

Size  Inches	No. 526		No. 528	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	26.50	28.00	29.50	31.00
5	28.50	30.00	31.50	33.00
6	33.00	35.00	36.00	38.00
7	40.25	42.50	44.75	47.00
8	47.50	50.00	52.50	55.00
10	76.00	80.00	84.00	88.00
12	100.50	105.00	110.50	115.00
14	129.50	135.00	144.50	150.00
16	152.50	160.00	167.50	175.00

Orders should specify whether outlet is to be on radial or intersecting center lines.

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

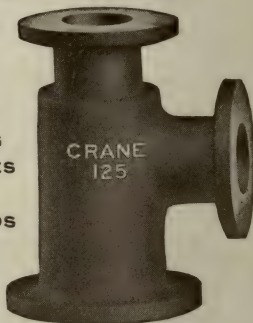
For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

# STANDARD CAST IRON FLANGED FITTINGS

**FLANGED TEES****No. 529**

**FOR  
STEAM  
WORKING  
PRESSURES  
UP TO  
125 POUNDS**

**REDUCING FLANGED TEES**

**REDUCING IN RUN OR BRANCH  
No. 531**

Size Inches	No. 529		No. 531	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	4.35	5.25		
1½	4.35	5.25	5.00	5.90
2	4.35	5.25	5.00	5.90
2½	4.55	5.45	5.25	6.15
3	5.00	6.10	5.75	6.85
3½	5.85	7.10	6.75	8.00
4	6.50	8.00	7.50	9.00
4½	8.00	9.50	9.25	10.75
5	9.10	10.60	10.50	12.00
6	11.00	12.95	12.65	14.60
7	15.25	17.50	17.50	19.75
8	17.40	19.80	20.00	22.40
9	24.65	28.00	28.50	31.85
10	27.50	31.50	31.50	35.50
12	40.50	45.00	46.50	51.00
14	60.00	65.50	69.00	74.50
15	68.00	74.75	78.00	84.75
16	79.00	86.50	91.00	98.50
18	103.00	112.00	118.00	127.00
20	130.00	140.00	150.00	160.00
22	164.00	177.00	189.00	202.00
24	203.00	218.00	233.00	248.00

For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.  
See page 772 for advanced prices beyond  
regular list and discount on Reducing Flanged  
Tees not carried in stock.

Larger sizes made to order. Prices on application. Furnished faced only, unless otherwise ordered.

## REDUCING FLANGED TEES

AN ASSORTMENT OF REDUCING FLANGED TEES, No. 531, IS CARRIED IN STOCK AS PER LIST ON PAGE 771. TO OVERCOME THE DELAY IN FILLING ORDERS FOR SUCH SIZES AS ARE NOT CARRIED IN STOCK, WE CAN USE THE REDUCING FLANGES WITH RIBS AS PER ILLUSTRATION AND NOTE ON PAGE 770, IF DESIRED BY THE CUSTOMER.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**DOUBLE SWEEP FLANGED TEES**  
No. 534



**REDUCING  
DOUBLE SWEEP FLANGED TEES**  
No. 536

Size Inches	No. 534		*No. 536	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	5.00	5.90		
2½	5.25	6.15	6.00	6.90
3	5.75	6.85	6.60	7.70
3½	6.75	8.00	7.75	9.00
4	7.50	9.00	8.65	10.15
4½	9.25	10.75	10.60	12.10
5	10.50	12.00	12.00	13.50
6	12.65	14.60	14.50	16.45
7	17.50	19.75	20.00	22.25
8	20.00	22.40	23.00	25.40
9	28.50	31.85	32.75	36.10
10	31.50	35.50	36.00	40.00
12	46.50	51.00	53.50	58.00
14	69.00	74.50	79.00	84.50
15	78.00	84.75	90.00	96.75
16	91.00	98.50	105.00	112.50

For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.  
See page 772 for advanced prices beyond  
regular list and discount on Reducing Flanged  
Tees not carried in stock.  
For list of reducing sizes carried in stock,  
see page 772.

\*Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted we will alter patterns (which will be expensive and change the dimensions) and charge at a special price. Dimensions on request.

We can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

Furnished faced only, unless otherwise ordered.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**SINGLE SWEEP FLANGED TEES**

**No. 533**

**REDUCING  
SINGLE SWEEP FLANGED TEES**  
REDUCING IN RUN OR BRANCH

**No. 535**

Size Inches	No. 533		No. 535	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	5.00	5.90		
2½	5.25	6.15	6.00	6.90
3	5.75	6.85	6.60	7.70
3½	6.75	8.00	7.75	9.00
4	7.50	9.00	8.65	10.15
4½	9.25	10.75	10.60	12.10
5	10.50	12.00	12.00	13.50
6	12.65	14.60	14.50	16.45
7	17.50	19.75	20.00	22.25
8	20.00	22.40	23.00	25.40
9	28.50	31.85	32.75	36.10
10	31.50	35.50	36.00	40.00
12	46.50	51.00	53.50	58.00
14	69.00	74.50	79.00	84.50
15	78.00	84.75	90.00	96.75
16	91.00	98.50	105.00	112.50

For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.  
See page 772 for advanced prices beyond  
regular list and discount on Reducing Flanged  
Tees not carried in stock.  
For list of reducing sizes carried in stock,  
see page 772.

Larger sizes made to order. Prices on application.

We do not make Single Sweep Tees with side openings larger than the run.

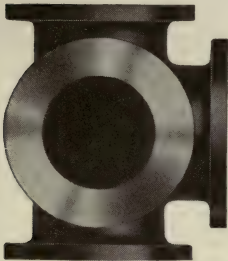
Furnished faced only, unless otherwise ordered.



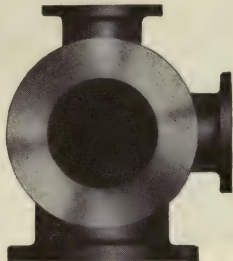
# STANDARD

## CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED**  
**SIDE OUTLET TEES**  
**No. 530**



**REDUCING**  
**SIDE OUTLET FLANGED TEES**  
**No. 532**

Size Inches	No. 530		No. 532	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	31.00	33.00	34.00	36.00
5	35.00	37.00	39.00	41.00
6	42.25	45.00	47.25	50.00
7	49.50	52.50	55.00	58.00
8	56.75	60.00	62.75	66.00
10	84.50	90.00	94.50	100.00
12	114.00	120.00	126.00	132.00
14	142.50	150.00	157.50	165.00
16	170.00	180.00	190.00	200.00

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 702 to 705.

For drilling templates, see pages 650 and 651.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED LATERALS**

**No. 541**



**REDUCING FLANGED LATERALS  
REDUCING IN RUN OR BRANCH**

**No. 543**

Size  Inches	No. 541		No. 543	
	Faced	Faced and Drilled	Faced	Faced and Drilled
	Each	Each	Each	Each
2	6.75	7.95		
2½	6.95	8.15	8.00	9.20
3	7.65	9.05	8.75	10.15
3½	9.00	10.70	10.35	12.05
4	10.00	12.00	11.50	13.50
4½	12.00	14.00	13.75	15.75
5	13.75	15.75	15.75	17.75
6	16.75	19.25	19.25	21.75
7	23.00	26.00	26.50	29.50
8	26.50	29.75	30.50	33.75
9	37.50	42.00	43.00	47.50
10	42.00	47.50	48.00	53.50
12	61.50	67.50	71.00	77.00
14	91.00	98.50	105.00	112.50
15	103.00	112.00	118.00	127.00
16	120.00	130.00	138.00	148.00

For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.  
See page 772 for advanced prices beyond regular list and discount on Reducing Flanged Laterals not carried in stock.  
For list of reducing sizes carried in stock, see page 772.

Larger sizes made to order only. Prices on application.  
Furnished faced only, unless otherwise ordered.

# STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED CROSSES**  
No. 537



**REDUCING FLANGED CROSSES**  
No. 539

Size Inches	No. 537		No. 539	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	6.75	7.95		
1½	6.75	7.95		
2	6.75	7.95	7.75	8.95
2½	6.95	8.15	8.00	9.20
3	7.65	9.05	8.75	10.15
3½	9.00	10.70	10.35	12.05
4	10.00	12.00	11.50	13.50
4½	12.00	14.00	13.75	15.75
5	13.75	15.75	15.75	17.75
6	16.75	19.25	19.25	21.75
7	23.00	26.00	26.50	29.50
8	26.50	29.75	30.50	33.75
9	37.50	42.00	43.00	47.50
10	42.00	47.50	48.00	53.50
12	61.50	67.50	71.00	77.00
14	91.00	98.50	105.00	112.50
15	103.00	112.00	118.00	127.00
16	120.00	130.00	138.00	148.00
18	157.00	169.00	180.00	192.00
20	198.00	212.00	228.00	242.00
22	248.00	266.00	285.00	303.00
24	310.00	330.00	355.00	375.00

For general dimensions, see pages 702 to 705.  
For drilling templates, see pages 650 and 651.  
See page 772 for advanced prices beyond  
regular list and discount on Reducing Flanged  
Crosses not carried in stock.  
For list of reducing sizes carried in stock  
see page 772.

Larger sizes made to order. Prices on application.  
Furnished faced only, unless otherwise ordered.

# STANDARD CAST IRON FLANGED FITTINGS FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



**FLANGED  
TAPER REDUCERS  
No. 547**



**FLANGED ECCENTRIC  
TAPER REDUCERS  
No. 548**

PRICES ON APPLICATION

No. 547			No. 548		
Size	Faced	Faced and Drilled	Size	Faced	Faced and Drilled
Inches	Each	Each	Inches	Each	Each
3×2	6.90	7.60	14×6	70.00	73.75
3½×2½ <sup>a</sup>	8.10	8.95	14×8	70.00	73.75
4×2	9.00	10.00	14×10	70.00	73.75
4×2½	9.00	10.00	14×12	70.00	73.75
4×3	9.00	10.00	15×8	80.00	84.50
5×2	12.50	13.50	15×10	80.00	84.50
5×2½	12.50	13.50	15×12	80.00	84.50
5×3	12.50	13.50	15×14	80.00	84.50
5×4	12.50	13.50	16×8	90.00	95.00
6×3	15.25	16.55	16×10	90.00	95.00
6×3½	15.25	16.55	16×12	90.00	95.00
6×4	15.25	16.55	16×14	90.00	95.00
6×5	15.25	16.55	18×10	105.00	111.00
7×3	21.00	22.50	18×12	105.00	111.00
7×4	21.00	22.50	18×14	105.00	111.00
7×5	21.00	22.50	18×16	105.00	111.00
7×6	21.00	22.50	20×12	120.00	127.00
8×3	24.00	25.60	20×14	120.00	127.00
8×4	24.00	25.60	20×16	120.00	127.00
8×5	24.00	25.60	20×18	120.00	127.00
8×6	24.00	25.60	22×14	150.00	159.00
10×4	38.00	40.70	22×16	150.00	159.00
10×5	38.00	40.70	22×18	150.00	159.00
10×6	38.00	40.70	22×20	150.00	159.00
10×8	38.00	40.70	24×16	190.00	200.00
12×5	56.00	59.00	24×18	190.00	200.00
12×6	56.00	59.00	24×20	190.00	200.00
12×8	56.00	59.00	24×22	190.00	200.00
12×10	56.00	59.00			

Flanged Taper Reducers of any other dimensions will be made to order at a special price.

For general dimensions, see pages 702 to 705. For drilling templates, see pages 650 and 651.

## GALVANIZED STANDARD FLANGED FITTINGS AND FLANGES

Galvanized Standard Cast Iron or Ferrosteel Flanged Fittings  
will be made to order at an advance over the black price as below:

### EXTRA PRICE FOR GALVANIZING

Size  Inches	No. 525 Flanged Elbows  No. 545 Reducing Flanged Elbows  No. 527 Flanged 45° Elbows  No. 547 Flanged Taper Reducers	Nos. 529, 531, 533, 534, 535, 536 Flanged Tees and Flanged Reducing Tees  Nos. 549, 550 Flanged Base Elbows  No. 551 Flanged Long Radius Elbows	Nos. 537, 539 Flanged Crosses and Flanged Reducing Crosses  Nos. 541, 543 Flanged Laterals and Flanged Reducing Laterals	Nos. 553, 558 Companion Flanges	No. 557 Reducing Companion Flanges  No. 555 Blind Flanges	
					Diam- eter Inches	Extra, Each
1¼	2.40	3.60	4.80	.60		
1½	2.40	3.60	4.80	.60		
2	2.40	3.60	4.80	.70	6	1.00
2½	2.50	3.75	5.00	.75	7	1.10
3	2.75	4.15	5.50	.85	7½	1.25
3½	3.25	4.90	6.50	1.00	8½	1.50
4	3.65	5.50	7.25	1.20	9	1.80
4½	4.35	6.50	8.75	1.25	9¼	1.90
5	4.85	7.25	9.75	1.35	10	2.00
6	6.00	9.00	12.00	1.65	11	2.50
7	8.00	12.00	16.00	2.15	12½	3.25
8	9.00	13.50	18.00	2.50	13½	3.75
9	13.00	19.50	26.00	3.00	15	4.50
10	14.50	22.00	29.00	3.75	16	5.75
12	21.00	31.00	42.00	5.00	19	7.50
14	30.00	45.00	60.00	7.00	21	10.50
15	35.00	52.50	70.00	9.00	22¼	13.50
16	40.00	60.00	80.00	10.50	23½	16.00



## EXTRA HEAVY FLANGED FITTINGS

### EXPLANATORY NOTES ON THE AMERICAN STANDARD

EFFECTIVE JANUARY 1, 1914

All Cast Iron and Ferrosteel Extra Heavy Fittings are recommended for steam working pressure up to 250 pounds, and are marked

**CRANE** For water working pressures, see page A.

<sup>250</sup> All Ferrosteel Fittings have the letters "F. S." cast on to distinguish the Cast Iron from the Ferrosteel Fittings.

All Extra Heavy Ferrosteel Flanged Fittings, except Laterals, are tested to 800 pounds hydraulic pressure. Laterals are tested to 600 pounds hydraulic pressure.

All Extra Heavy Cast Steel Flanged Fittings are recommended for superheated steam up to 350 pounds working pressure and a total temperature of 800 degrees Fahrenheit. They are marked **CRANE**

For water working pressures, see page A.

All Extra Heavy Cast Steel Flanged Fittings are tested to hydraulic pressure corresponding to the water working pressure.

All Extra Heavy Fittings and Flanges have a raised surface, for gaskets,  $\frac{1}{8}$  inch high inside of bolt holes.

The Bolt Holes are drilled  $\frac{1}{8}$  inch larger than the diameter of the bolts and straddle the center line.

The Bolt Holes on Extra Heavy Cast Iron and Ferrosteel Flanged Fittings will not be spot faced unless so ordered, for which an extra charge will be made. The bolt holes for Extra Heavy Cast Steel Flanged Fittings are regularly furnished spot faced.

All Extra Heavy Flanged Fittings ordered to comply with the A. S. M. E. Boiler Code are regularly furnished spot faced.

Square head bolts with hexagonal nuts are recommended.

For Bolts  $1\frac{1}{8}$  inches diameter and larger, studs with a nut on each end are satisfactory.

Hexagonal Nuts for pipe sizes 1 inch to 16 inches can be conveniently pulled up with open wrenches of minimum design of heads.

Hexagonal Nuts for pipe sizes 18 inches to 48 inches can be conveniently pulled up with box wrenches.

Extra Heavy Reducing Elbows carry same dimensions center to face as regular Elbows of largest straight size.

Extra Heavy Tees, Crosses and Laterals, reducing on run only, carry same dimensions face to face as largest straight size.

Where Long Radius Fittings are specified, it has reference only to Elbows which are made in two center to face dimensions known as Elbows and Long Radius Elbows, the latter being used only when so specified.

The face to face dimension of Reducers, either straight or eccentric, is the same face to face as given in table of dimensions.

Double Branch Elbows, whether straight or reducing, carry same dimensions center to face and face to face as regular straight size Elbows and Tees.

Side Outlet Elbows and Side Outlet Tees, whether straight or reducing sizes, carry same dimensions center to face and face to face as regular Tees having same reductions.

Bull Head Tees or Tees increasing on outlet will have same center to face and face to face dimensions as a straight fitting of the size of the outlet.

Tees, Crosses and Laterals 16 inches and down, reducing on the outlet or branch, use the same dimensions as straight sizes of the larger port.

Size 18 inches and up, reducing on the outlet or branch, are made in two lengths depending on the size of the outlet as given in the table of dimensions.

The dimensions of reducing flanged fittings are always regulated by the reductions of the outlet or branch. Fittings reducing on the run only, the long body pattern will always be used.

"Y's" are special and are made to suit conditions.

Double Sweep Tees are not made reducing on the run.

## **EXTRA HEAVY FLANGED FITTINGS**

### **CAST IRON OR FERROSTEEL**

**FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

**FOR WATER WORKING PRESSURES, SEE PAGE A**

**EXTRA HEAVY CAST IRON FLANGED FITTINGS ARE MARKED  
CRANE 250**

**EXTRA HEAVY FERROSTEEL FLANGED FITTINGS ARE MARKED  
CRANE 250 FS**

### **THE BURSTING POINT OF EXTRA HEAVY FLANGED FITTINGS**

Some years ago Crane Co. made a series of tests to determine the average point at which flanged fittings of various sizes would burst under hydraulic pressure. The rules laid down in engineering text-books have been made from experiments on cylinders and not on fittings, and it was considered advisable to establish by actual destruction the ultimate strength of fittings of various kinds. For this purpose it was decided to burst several fittings of each size under conditions which, as nearly as possible, would establish their true strength.

All tests were made by bolting blind flanges to the openings of the fittings and admitting water through a small opening in one flange. At the outset trouble was experienced with the bolting; regular bolts would not stand the strain and unduly increasing the size weakened the flanges materially. This was overcome by making special bolts of steel having higher tensile strength, using one size larger bolts than regular.

As the bolts had to be pulled up so tightly to hold the gaskets under extreme pressures, too much strain was put upon the flanges where they joined the bodies and the fittings would break at those points before the bursting point of the bodies had been reached. A "U" shaped gasket of leather solved this trouble and it was found possible to hold extreme pressures without putting an abnormal strain upon the flanges.

Each fitting was cast with a key number for the purpose of identifying the date and heat for comparison with test bars run out of the same ladle. This gave us a check against any fitting which might show strength or weakness beyond the average.

The test bars were found to run very uniform, however, the variation in thirty heats being 20 per cent between the highest and lowest bar and the average variation being only about 5 per cent. As test bars cast from the same ladle, in the same mold, at the same time, will show a variation in strength, it was concluded to accept the average strength of all bars made for these tests as the strength of metal in these fittings.

These bars averaged in tensile strength:

Ferrosteel, 33,000 pounds per square inch.

Cast Iron, 22,000 pounds per square inch.

The results of the destructive tests were as follows:

### EXTRA HEAVY FITTINGS—TEES

Size, Inches	Body Metal, Inches	Burst Ferro- steel, pounds persquareinch	Average	Burst Cast Iron, pounds persquareinch	Average
6	$\frac{3}{4}$	2,700	.....	.....	.....
6	$\frac{3}{4}$	2,500	.....	1,675	.....
6	$\frac{3}{4}$	3,000	2,733	1,700	1,687
8	$\frac{1}{2}$	2,100	.....	.....	.....
8	$\frac{1}{2}$	2,250	.....	.....	.....
8	$\frac{1}{2}$	2,250	.....	.....	.....
8	$\frac{1}{2}$	2,100	.....	.....	.....
8	$\frac{1}{2}$	2,500	.....	1,200	.....
8	$\frac{1}{2}$	2,300	2,250	1,500	1,350
10	$\frac{1}{2}$	2,200	.....	.....	.....
10	$\frac{1}{2}$	2,200	.....	1,225	.....
10	$\frac{1}{2}$	2,100	.....	1,300	.....
10	$\frac{1}{2}$	2,000	.....	1,200	.....
10	$\frac{1}{2}$	2,300	2,160	1,500	1,306
12	1	2,200	.....	.....	.....
12	1	2,100	.....	1,100	.....
12	1	2,000	.....	1,400	.....
12	1	2,000	.....	1,500	.....
12	1	2,100	.....	1,450	.....
12	1	1,800	2,033	1,450	1,380
14	$1\frac{1}{8}$	1,900	.....	.....	.....
14	$1\frac{1}{8}$	1,750	1,825	1,100	1,100
16	$1\frac{1}{8}$	1,700	.....	1,050	.....
16	$1\frac{1}{8}$	1,700	1,700	1,000	1,025
18	$1\frac{1}{4}$	1,600	.....	.....	.....
18	$1\frac{1}{4}$	1,300	1,450	600	600
20	$1\frac{3}{8}$	1,400	.....	.....	.....
20	$1\frac{3}{8}$	1,150	1,275	750	750
24	$1\frac{1}{2}$	1,300	1,300	700	700

### EXTRA HEAVY FITTINGS—ELLS

Size, Inches	Body Metal, Inches	Burst Ferro- steel, pounds per square inch	Average	Burst Cast Iron, pounds persquareinch	Average
6	$\frac{3}{4}$	2,800	.....	.....	.....
6	$\frac{3}{4}$	3,500	.....	2,350	.....
6	$\frac{3}{4}$	3,500	3,266	2,200	2,275
8	$\frac{1}{2}$	2,700	.....	1,700	.....
8	$\frac{1}{2}$	2,800	.....	1,600	.....
8	$\frac{1}{2}$	2,800	.....	1,500	.....
8	$\frac{1}{2}$	2,600	2,725	1,700	1,625
10	$\frac{1}{2}$	2,550	.....	1,625	.....
10	$\frac{1}{2}$	2,000	.....	1,400	.....
10	$\frac{1}{2}$	2,500	2,350	1,600	1,541
12	1	2,000	.....	1,275	.....
12	1	2,200	.....	*900	.....
12	1	2,200	2,133	*700	1,275
14	$1\frac{1}{8}$	1,700	.....	900	.....
14	$1\frac{1}{8}$	.....	.....	1,250	1,075
16	$1\frac{3}{8}$	2,100	.....	1,250	1,250

\* Defective, eliminated from total.

Average of all averages, bursting pressure per square inch:—

Ferrosteel, 2,066 pounds per fitting.

Cast Iron, 1,263 pounds per fitting.

Ferrosteel fittings show stronger than cast iron by 63.70 per cent.

Ferrosteel bars show stronger than cast iron bars by 50 per cent.

For the purpose of more accurate comparison between the bursting point of fittings and the tensile strength of test bars cast at the same time, a few examples of 12 inch extra heavy tees are given.

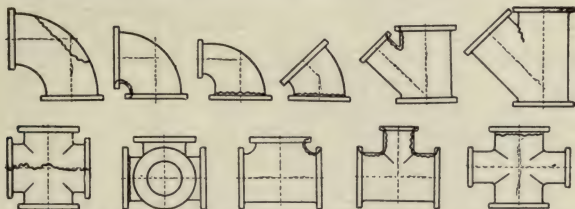
### 12 INCH EXTRA HEAVY TEES

Burst Ferrosteel, pounds per square inch	Tensile strength of Test Bar, pounds per square inch	Burst Cast Iron, pounds per square inch	Tensile strength of Test Bar, pounds per square inch
2,100	33,710	1,450	*21,550
2,200	32,690	1,500	22,190
2,000	32,630	1,450	22,940
2,100	34,070	.....	.....
2,000	33,200	.....	.....
1,800	31,730	.....	.....
12,200 Total	198,030 Total	4,400 Total	66,680 Total
2,033 Average	33,005 Average	1,466 Average	22,226 Average

\*Flaw in test bar.

### FORM AS A FACTOR IN DETERMINING BURSTING STRENGTH

It may not occur to some engineers that the shape of a fitting, to a great extent, determines its bursting strength. In testing out various fittings in the past Crane Co. has realized this and believes that its importance should be generally recognized.



To demonstrate the point clearly a selection was made of the following fittings of a certain size and they were subjected to hydraulic pressure to destruction. The results are typical with past experience both as to size and weight of fitting determined by the working pressure. Fittings were of uniform metal thickness throughout and the fractures showed clear metal without porous spots or sand holes:

Fitting	Burst at, Pounds	Fitting	Burst at, Pounds
Long Turn Ell.....	2800	Reducing Cross (Large openings same as straight cross).....	1600
45° Ell.....	2600	Four-way Tee.....	1600
Reducing Ell (Large opening same as straight ell).....	2600	Straight Tee.....	1500
Straight Ell.....	2400	Reducing Lateral (Large openings same as straight lateral).....	1500
Reducing Tee (Large openings same as straight tee).....	1700	Straight Cross.....	1400
		Straight Lateral.....	800

From the foregoing figures it will be seen that the strength of Ells is practically the same regardless of degree or whether of straight or reducing sizes.

The figures also show that fittings of the same general shape as the Tee or Cross are of nearly the same strength and have relatively about two-thirds the strength of fittings of the Ell shape.

It is noticeable that the straight lateral is weak, having, in fact, only about one-third the strength of the Ell shape.



## EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED ELBOWS**  
**No. 101 E**



**45° FLANGED ELBOWS**  
**No. 103 E**

Size Inches	No. 101 E		No. 103 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	4.50	5.40	5.00	5.90
1½	4.50	5.40	5.00	5.90
2	4.50	5.40	5.00	5.90
2½	4.75	5.65	5.25	6.15
3	5.15	6.25	5.65	6.75
3½	6.10	7.35	6.75	8.00
4	6.75	8.25	7.50	9.00
4½	8.25	9.75	9.00	10.50
5	9.35	10.85	10.35	11.85
6	11.40	13.40	12.50	14.50
7	15.75	18.00	16.50	18.75
8	18.00	20.50	19.00	21.50
9	25.50	28.85	26.75	30.10
10	28.50	32.50	30.00	34.00
12	42.00	46.50	44.00	48.50
14	62.00	67.50	62.00	67.50
15	70.00	77.00	70.00	77.00
16	82.00	90.00	82.00	90.00
18	106.00	115.00	106.00	115.00
20	135.00	145.00	135.00	145.00
22	170.00	183.00	170.00	183.00
24	210.00	225.00	210.00	225.00

Furnished faced only, unless otherwise ordered.

Made to order of FERROSTEEL, sizes 3¼ inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.



**EXTRA HEAVY  
CAST IRON FLANGED FITTINGS  
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**FLANGED  
SQUARE BASE ELBOWS  
No. 125 E**



**FLANGED  
ROUND BASE ELBOWS  
No. 125½ E**

Size  Inches	No. 125 E or No. 125½ E		
	Faced Except Base Flange	Faced and Drilled Except Base Flange	Facing and Drilling Base Flange
Each	Each	Each	Each
4	13.50	15.00	4.50
4½	16.50	18.00	4.50
5	18.75	20.25	5.25
6	22.75	24.75	5.25
7	31.50	33.75	5.25
8	36.00	38.50	7.50
9	51.00	54.35	7.50
10	57.00	61.00	7.50
12	84.00	88.50	11.00
14	105.00	110.50	11.00
15	120.00	127.00	11.00
16	135.00	143.00	11.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

FLANGED BASE TEES MADE TO ORDER. PRICES ON APPLICATION

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

**EXTRA HEAVY  
CAST IRON FLANGED FITTINGS  
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**FLANGED LONG RADIUS ELBOWS  
No. 127 E**

Size Inches	No. 127 E		Radius Inches
	Faced Each	Faced and Drilled Each	
2	7.50	8.85	5 $\frac{1}{4}$
2 $\frac{1}{2}$	8.00	9.35	5 $\frac{5}{8}$
3	8.60	10.25	6 $\frac{1}{4}$
3 $\frac{1}{2}$	10.25	12.15	6 $\frac{7}{8}$
4	11.25	13.50	7 $\frac{3}{8}$
4 $\frac{1}{2}$	13.75	16.00	7 $\frac{3}{4}$
5	15.50	17.75	8 $\frac{1}{2}$
6	19.00	22.00	9 $\frac{5}{8}$
7	26.50	29.85	10 $\frac{7}{8}$
8	30.00	33.75	12
9	42.50	47.50	13
10	47.75	53.75	14 $\frac{1}{8}$
12	70.00	76.75	16 $\frac{1}{2}$
14	103.50	111.75	18 $\frac{7}{8}$
15	117.00	127.00	20
16	137.00	149.00	21 $\frac{1}{4}$
18	177.00	191.00	23 $\frac{5}{8}$
20	225.00	240.00	26

Furnished faced only, unless otherwise ordered.

Made to order of FERROSTEEL, sizes 3 $\frac{1}{2}$  inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

Long Radius Elbows of different dimensions from above made to order at a special price.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.

**EXTRA HEAVY  
CAST IRON FLANGED FITTINGS  
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



**FLANGED REDUCING TAPER ELBOWS  
No. 121 E**

Size Inches	No. 121 E		Size Inches	No. 121 E	
	Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each
2×1¼	9.00	9.90	7×6	31.50	33.75
2×1½	9.00	9.90	8×4	36.00	38.50
2½×1½	9.50	10.40	8×5	36.00	38.50
2½×2	9.50	10.40	8×6	36.00	38.50
3×1½	10.25	11.35	8×7	36.00	38.50
3×2	10.25	11.35	10×5	57.00	61.00
3×2½	10.25	11.35	10×6	57.00	61.00
3½×2	12.25	13.50	10×7	57.00	61.00
3½×2½	12.25	13.50	10×8	57.00	61.00
3½×3	12.25	13.50	12×7	84.00	88.50
4×2	13.50	15.00	12×8	84.00	88.50
4×2½	13.50	15.00	12×9	84.00	88.50
4×3	13.50	15.00	12×10	84.00	88.50
4×3½	13.50	15.00	14×6	105.00	110.50
5×2½	18.75	20.25	14×10	105.00	110.50
5×3	18.75	20.25	14×12	105.00	110.50
5×4	18.75	20.25	15×6	120.00	127.00
6×3	22.75	24.75	15×10	120.00	127.00
6×3½	22.75	24.75	15×12	120.00	127.00
6×4	22.75	24.75	16×8	135.00	143.00
6×4½	22.75	24.75	16×10	135.00	143.00
6×5	22.75	24.75	16×12	135.00	143.00
7×4	31.50	33.75	16×14	135.00	143.00
7×5	31.50	33.75			

Furnished faced only, unless otherwise ordered.

Flanged Taper Reducing Elbows not listed above will be made to order at a special price.

Made to order of Ferrosteeel, sizes 3½ inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

## EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED  
DOUBLE BRANCH ELBOWS  
No. 139 E**



**REDUCING DOUBLE BRANCH  
FLANGED ELBOWS  
No. 141 E**

Size  Inches	No. 139 E		No. 141 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	35.75	38.00	39.75	42.00
5	42.75	45.00	47.75	50.00
6	49.50	52.50	54.50	57.50
7	56.50	60.00	62.50	66.00
8	66.25	70.00	73.75	77.50
10	84.00	90.00	94.00	100.00
12	108.25	115.00	118.25	125.00
14	141.75	150.00	156.75	165.00
16	168.00	180.00	188.00	200.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

Lists given above for No. 141 E are for Fittings reducing on the branches with branches same size. If Fittings are wanted with branches two different sizes or reducing on inlet they will be made to order at a special price.

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

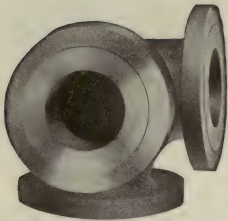
For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

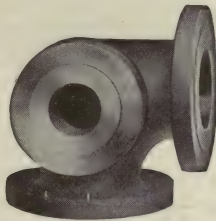
## EXTRA HEAVY

# CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED  
SIDE OUTLET ELBOWS  
No. 131 E**



**REDUCING SIDE OUTLET  
FLANGED ELBOWS  
No. 133 E**

Size Inches	No. 131 E		No. 133 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	35.75	38.00	39.75	42.00
5	37.75	40.00	41.75	44.00
6	42.00	45.00	47.00	50.00
7	51.75	55.00	56.75	60.00
8	61.25	65.00	67.25	71.00
10	89.00	95.00	99.00	105.00
12	113.25	120.00	123.25	130.00
14	146.75	155.00	161.75	170.00
16	168.00	180.00	183.00	195.00

Orders should specify whether outlet is to be on radial or intersecting center lines.

**MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT**

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 706 to 709.

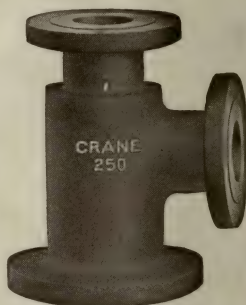
For drilling templates, see page 652.



# EXTRA HEAVY CAST IRON FLANGED FITTINGS



FOR  
STEAM  
WORKING  
PRESSURES  
UP TO  
250 POUNDS

**FLANGED TEES****No. 105 E****REDUCING FLANGED TEES  
REDUCING IN RUN OR BRANCH****No. 107 E**

Size Inches	No. 105 E		No. 107 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	6.50	7.85		
1½	6.50	7.85	7.50	8.85
2	6.50	7.85	7.50	8.85
2½	6.90	8.25	8.00	9.35
3	7.50	9.15	8.60	10.25
3½	8.90	10.80	10.25	12.15
4	9.75	12.00	11.25	13.50
4½	12.00	14.25	13.75	16.00
5	13.50	15.75	15.50	17.75
6	16.50	19.50	19.00	22.00
7	23.00	26.35	26.50	29.85
8	26.00	29.75	30.00	33.75
9	37.00	42.00	42.50	47.50
10	41.50	47.50	47.75	53.75
12	61.00	67.75	70.00	76.75
14	90.00	98.25	103.50	111.75
15	102.00	112.00	117.00	127.00
16	119.00	131.00	137.00	149.00
18	154.00	168.00	177.00	191.00
20	195.00	210.00	225.00	240.00
22	247.00	267.00	285.00	305.00
24	305.00	328.00	350.00	373.00

For general dimensions, see pages 706 to 709.

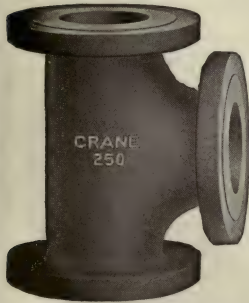
For drilling templates, see page 652.

See page 775 for advanced prices beyond regular list and discount on Reducing Flanged Tees not carried in stock.

Made to order of FERROSTEEL, sizes 3½ inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

AN ASSORTMENT OF REDUCING TEES No. 107 E IS CARRIED IN STOCK AS PER LIST ON PAGES 774 AND 775. TO OVERCOME THE DELAY IN FILLING ORDERS FOR SUCH SIZES AS ARE NOT CARRIED IN STOCK, WE CAN USE THE REDUCING FLANGES WITH RIBS, AS PER NOTE AND ILLUSTRATION ON PAGE 773, IF DESIRED BY THE CUSTOMER.

## EXTRA HEAVY CAST IRON FLANGED FITTINGS



FOR  
STEAM  
WORKING  
PRESSURES  
UP TO  
250 POUNDS



DOUBLE SWEEP FLANGED TEES

No. 112 E

REDUCING  
DOUBLE SWEEP FLANGED TEES

No. 112½ E

Size Inches	No. 112 E		*No. 112½ E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	7.50	8.85		
2½	8.00	9.35	9.15	10.50
3	8.60	10.25	9.90	11.55
3½	10.25	12.15	11.75	13.65
4	11.25	13.50	13.00	15.25
4½	13.75	16.00	15.75	18.00
5	15.50	17.75	17.85	20.10
6	19.00	22.00	22.00	25.00
7	26.50	29.85	30.50	33.85
8	30.00	33.75	34.50	38.25
9	42.50	47.50	49.00	54.00
10	47.75	53.75	55.00	61.00
12	70.00	76.75	80.00	86.75
14	103.50	111.75	119.00	127.25
15	117.00	127.00	135.00	145.00
16	137.00	149.00	158.00	170.00
18	177.00	191.00	204.00	218.00
20	225.00	240.00	260.00	275.00
22	285.00	305.00	327.00	347.00
24	350.00	373.00	402.00	425.00

For general dimensions, see pages 706 to 709.  
 For drilling templates, see page 652.  
 See page 775 for advanced prices beyond regular  
 list and discount on Reducing Flanged Tees not  
 carried in stock.  
 For list of reducing sizes carried in stock, see  
 page 775.

Furnished faced only, unless otherwise ordered.

Made to order of FERROSTEEL, sizes 3½ inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

\*Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted, we will alter patterns (which will be expensive and change the dimensions) and charge at a special price. Dimensions on request. We can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

**EXTRA HEAVY  
CAST IRON FLANGED FITTINGS  
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**



SINGLE SWEEP FLANGED TEES

No. 109 E



**REDUCING  
SINGLE SWEEP FLANGED TEES  
REDUCING IN RUN OR BRANCH  
No. 111 E**

Size Inches	No. 109 E		No. 111 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	7.50	8.85		
2½	8.00	9.35	9.15	10.50
3	8.60	10.25	9.90	11.55
3½	10.25	12.15	11.75	13.65
4	11.25	13.50	13.00	15.25
4½	13.75	16.00	15.75	18.00
5	15.50	17.75	17.85	20.10
6	19.00	22.00	22.00	25.00
7	26.50	29.85	30.50	33.85
8	30.00	33.75	34.50	38.25
9	42.50	47.50	49.00	54.00
10	47.75	53.75	55.00	61.00
12	70.00	76.75	80.00	86.75
14	103.50	111.75	119.00	127.25
15	117.00	127.00	135.00	145.00
16	137.00	149.00	158.00	170.00
18	177.00	191.00	204.00	218.00
20	225.00	240.00	260.00	275.00
22	285.00	305.00	327.00	347.00
24	350.00	373.00	402.00	425.00

For general dimensions, see pages 706 to 709.  
For drilling templates, see page 652.  
See page 775 for advanced prices beyond regular list and discount on Reducing Flanged Tees not carried in stock.  
For list of reducing sizes carried in stock, see page 775.

Furnished faced only, unless otherwise ordered.

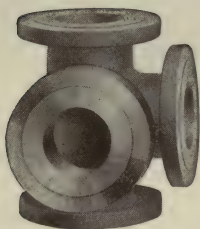
Made to order of FERROSTEEL, sizes 3½ inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

We do not make Single Sweep Tees with side openings larger than the run.

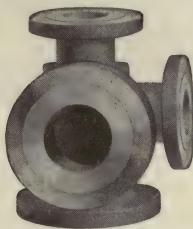
## EXTRA HEAVY

### CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED  
SIDE OUTLET TEES**  
No. 135 E



**REDUCING SIDE OUTLET  
FLANGED TEES**  
No. 137 E

Size Inches	No. 135 E		No. 137 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	42.00	45.00	47.00	50.00
5	47.00	50.00	52.00	55.00
6	53.50	57.50	59.00	63.00
7	63.00	67.50	70.50	75.00
8	72.50	77.50	80.00	85.00
10	102.00	110.00	112.00	120.00
12	131.00	140.00	146.00	155.00
14	159.00	170.00	174.00	185.00
16	184.00	200.00	204.00	220.00

MADE TO ORDER OF FERROSTEEL AT AN ADVANCE OF 25 PER CENT

Furnished faced only, unless otherwise ordered.

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

## EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED LATERALS**

**No. 117 E**



**REDUCING FLANGED LATERALS  
REDUCING IN RUN OR BRANCH**

**No. 119 E**

Size Inches	No. 117 E		No. 119 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	10.00	11.80		
2½	10.50	12.30	12.00	13.80
3	11.50	13.75	13.25	15.50
3½	13.50	16.00	15.50	18.00
4	15.00	18.00	17.00	20.00
4½	18.00	21.00	21.00	24.00
5	20.50	23.50	23.50	26.50
6	25.00	29.00	29.00	33.00
7	35.00	39.50	40.00	44.50
8	40.00	45.00	46.00	51.00
9	56.00	62.75	65.00	71.75
10	63.00	71.00	72.00	80.00
12	92.00	101.00	106.00	115.00
14	136.00	147.00	158.00	169.00
15	155.00	169.00	177.00	191.00
16	180.00	196.00	207.00	223.00
18	235.00	253.00	270.00	288.00
20	300.00	320.00	345.00	365.00
22	375.00	401.00	430.00	456.00
24	465.00	495.00	535.00	565.00

For general dimensions, see pages 706 to 709.  
 For drilling templates, see page 652.  
 See page 775 for advanced prices beyond regular  
 list and discount on Reducing Flanged Laterals  
 not carried in stock.  
 For list of reducing sizes carried in stock, see  
 page 775.

Made to order of FERROSTEEL, sizes 3½ inch and smaller, at an advance of 50 per cent., and sizes 4 inch and larger, at an advance of 25 per cent.

Furnished faced only, unless otherwise ordered.



# EXTRA HEAVY CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



**FLANGED CROSSES**  
No. 113 E



**REDUCING FLANGED CROSSES**  
No. 115 E

Size Inches	No. 113 E		No. 115 E	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1¼	10.00	11.80		
1½	10.00	11.80		
2	10.00	11.80	11.50	13.30
2½	10.50	12.30	12.00	13.80
3	11.50	13.75	13.25	15.50
3½	13.50	16.00	15.50	18.00
4	15.00	18.00	17.00	20.00
4½	18.00	21.00	21.00	24.00
5	20.50	23.50	23.50	26.50
6	25.00	29.00	29.00	33.00
7	35.00	39.50	40.00	44.50
8	40.00	45.00	46.00	51.00
9	56.00	62.75	65.00	71.75
10	63.00	71.00	72.00	80.00
12	92.00	101.00	106.00	115.00
14	136.00	147.00	158.00	169.00
15	155.00	169.00	177.00	191.00
16	180.00	196.00	207.00	223.00
18	235.00	253.00	270.00	288.00
20	300.00	320.00	345.00	365.00
22	375.00	401.00	430.00	456.00
24	465.00	495.00	535.00	565.00

For general dimensions, see pages 706 to 709.  
For drilling templates, see page 652.  
See page 775 for advanced prices beyond regular  
list and discount on Reducing Flanged Crosses not  
carried in stock.  
For list of reducing sizes carried in stock, see  
page 775.

Made to order of FERROSTEEL, sizes 3½ inch and smaller, at an advance of 50 per cent., and  
sizes 4 inch and larger, at an advance of 25 per cent.  
Furnished faced only, unless otherwise ordered.

# EXTRA HEAVY CAST IRON FLANGED FITTINGS



**FLANGED  
TAPER REDUCERS  
No. 123 E**

**FOR STEAM  
WORKING PRESSURES  
UP TO 250 POUNDS**



**FLANGED ECCENTRIC  
TAPER REDUCERS  
No. 123 1/2 E  
PRICES ON APPLICATION**

Size Inches	No. 123 E		Size Inches	No. 123 E	
	Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each
2½×2	9.50	10.40	12×10	84.00	88.50
3×2	10.25	11.35	14×6	105.00	110.50
3½×2½	12.25	13.50	14×8	105.00	110.50
4×2	13.50	15.00	14×10	105.00	110.50
4×2½	13.50	15.00	14×12	105.00	110.50
4×3	13.50	15.00	15×8	120.00	127.00
5×2	18.75	20.25	15×10	120.00	127.00
5×2½	18.75	20.25	15×12	120.00	127.00
5×3	18.75	20.25	15×14	120.00	127.00
5×4	18.75	20.25	16×8	135.00	143.00
6×3	22.75	24.75	16×10	135.00	143.00
6×3½	22.75	24.75	16×12	135.00	143.00
6×4	22.75	24.75	16×14	135.00	143.00
6×5	22.75	24.75	18×10	157.00	166.00
7×3	31.50	33.75	18×12	157.00	166.00
7×4	31.50	33.75	18×14	157.00	166.00
7×5	31.50	33.75	18×16	157.00	166.00
7×6	31.50	33.75	20×12	180.00	190.00
8×3	36.00	38.50	20×14	180.00	190.00
8×4	36.00	38.50	20×16	180.00	190.00
8×5	36.00	38.50	20×18	180.00	190.00
8×6	36.00	38.50	22×14	225.00	238.00
10×4	57.00	61.00	22×16	225.00	238.00
10×5	57.00	61.00	22×18	225.00	238.00
10×6	57.00	61.00	22×20	225.00	238.00
10×8	57.00	61.00	24×16	285.00	300.00
12×5	84.00	88.50	24×18	285.00	300.00
12×6	84.00	88.50	24×20	285.00	300.00
12×8	84.00	88.50	24×22	285.00	300.00

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

Flanged Taper Reducers of any other dimensions, or Ferrosteel, will be made to order at a special price.

## GALVANIZED EXTRA HEAVY FLANGED FITTINGS AND FLANGES

Galvanized Extra Heavy, Cast Iron or Ferrosteel Flanged Fittings and Companion Flanges will be made to order at an advance over the black price as below:

### EXTRA PRICE FOR GALVANIZING

Size  Inches	No. 101E Flanged Elbows  No. 121E Reducing Flanged Elbows  No. 103E Flanged 45° Elbows or No. 123E Flanged Taper Reducers	Nos. 105E, 107E, 109E, 111E, 112E, 112½E Flanged Tees and Flanged Reducing Tees  Nos. 125E, 125½E Flanged Base Elbows or No. 127E Flanged Long Radius Elbows	Nos. 113E, 115E Flanged Crosses and Flanged Reducing Crosses or Nos. 117E, 119E Flanged Laterals and Flanged Reducing Laterals	Nos. 151E, 251E Companion Flanges	Nos. 155E, 255E Reducing Companion Flanges or Nos. 153E, 253E Blind Flanges	
					Diam- eter Inches	Extra, Each
1¼	3.00	4.50	6.00	.85		
1½	3.00	4.50	6.00	.85	6	1.25
2	3.00	4.50	6.00	1.00	6½	1.50
2½	3.10	4.65	6.25	1.05	7½	1.60
3	3.50	5.25	7.00	1.15	8¼	1.75
3½	4.10	6.15	8.25	1.40	9	2.10
4	4.50	6.75	9.00	1.65	10	2.50
4½	5.50	8.25	11.00	1.75	10½	2.65
5	6.00	9.00	12.00	1.90	11	2.85
6	7.50	11.25	15.00	2.30	12½	3.50
7	10.00	15.00	20.00	3.00	14	4.50
8	11.25	16.75	22.50	3.50	15	5.25
9	16.00	24.00	32.00	4.15	16¼	6.25
10	18.00	27.00	36.00	5.25	17½	8.00
12	26.00	39.00	52.00	7.00	20½	10.50
14	37.50	56.00	75.00	10.00	23	15.00
15	44.00	66.00	88.00	12.50	24½	19.00
16	50.00	75.00	100.00	15.00	25½	22.50

**EXTRA HEAVY HYDRAULIC  
FERROSTEEL  
FLANGED FITTINGS**

**FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:**  
1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
4½ TO 8 INCH, 800 LBS. HYDROSTATIC

**TESTED TO 2000 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH**



**ELBOWS**



**45° ELBOWS**

**FURNISHED MALE OR FEMALE AS ORDERED**

Size  Inches	ELBOWS		45° ELBOWS	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1½	15.00	17.00	15.00	17.00
2	17.00	19.00	17.00	19.00
2½	18.00	20.50	18.00	20.50
3	20.00	22.50	20.00	22.50
3½	22.50	26.00	22.50	26.00
4	26.00	30.00	26.00	30.00
4½	33.50	37.50	33.50	37.50
5	38.00	42.00	38.00	42.00
6	46.00	50.00	46.00	50.00
7	57.50	65.00	57.50	65.00
8	67.50	75.00	67.50	75.00

**WORKING PRESSURES**

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are NOT recommended for these pressures. See explanatory notes on page 153.

**AIR OR GAS**

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

Other sizes made to order. Prices on application.  
Dimensions, pages 710 and 711. Templates for drilling, page 653.

# EXTRA HEAVY HYDRAULIC FERROSTEEL FLANGED FITTINGS

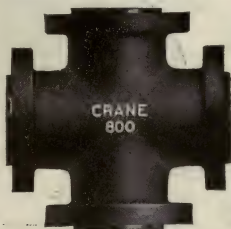
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
4½ TO 8 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH



**TEES**



**CROSSES**

FURNISHED MALE OR FEMALE AS ORDERED

Size Ins.	TEES		REDUCING TEES		CROSSES		REDUCING CROSSES	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1½	20.00	22.50	20.00	22.50	28.50	31.50	28.50	31.50
2	22.50	25.00	22.50	25.00	32.00	35.00	32.00	35.00
2½	24.00	27.00	24.00	27.00	33.50	37.50	33.50	37.50
3	27.00	30.00	27.00	30.00	38.00	42.00	38.00	42.00
3½	30.00	35.00	30.00	35.00	43.00	49.00	43.00	49.00
4	35.00	40.00	35.00	40.00	49.00	55.00	49.00	55.00
4½	45.00	50.00	45.00	50.00	64.00	70.00	64.00	70.00
5	50.00	55.00	50.00	55.00	69.00	75.00	69.00	75.00
6	60.00	65.00	60.00	65.00	84.00	90.00	84.00	90.00
7	75.00	85.00	75.00	85.00	107.50	120.00	107.50	120.00
8	90.00	100.00	90.00	100.00	122.50	135.00	122.50	135.00

## WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

## AIR OR GAS

Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

Other sizes made to order. Prices on application.

Dimensions, pages 710 and 711. Templates for drilling, page 653.



**EXTRA HEAVY  
CAST STEEL FLANGED FITTINGS**  
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES  
FOR WATER WORKING PRESSURES, SEE PAGE A



**FLANGED ELBOWS  
No. 101 D**



**45° FLANGED ELBOWS  
No. 103 D**

Size Inches	No. 101 D		No. 103 D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
1¼	9.00	11.00	9.00	11.00
1½	10.00	12.00	10.00	12.00
2	11.00	13.00	11.00	13.00
2½	13.00	15.00	13.00	15.00
3	14.00	17.00	14.00	17.00
3½	17.00	20.00	17.00	20.00
4	19.00	22.00	19.00	22.00
4½	22.00	25.00	22.00	25.00
5	24.00	27.00	24.00	27.00
6	29.00	33.00	29.00	33.00
7	36.00	41.00	36.00	41.00
8	43.00	48.00	43.00	48.00
9	52.00	57.00	52.00	57.00
10	61.00	67.00	61.00	67.00
12	77.00	84.00	77.00	84.00
14	100.00	108.00	100.00	108.00
15	112.00	120.00	112.00	120.00
16	130.00	140.00	130.00	140.00
18	170.00	180.00	170.00	180.00
20	210.00	225.00	210.00	225.00
22	270.00	290.00	270.00	290.00
24	335.00	355.00	335.00	355.00

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{16}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES

FOR WATER WORKING PRESSURES, SEE PAGE A



**FLANGED  
SQUARE BASE ELBOWS**  
No. 125 D



**FLANGED  
ROUND BASE ELBOWS**  
No. 125 1/2 D

Size  Inches	No. 125 D or No. 125 1/2 D		
	Faced, Except Base Flange Each	Faced, Drilled and Spot Faced, Except Base Flange	Facing, Drilling and Spot Facing Base Flange
4	28.00	32.00	3.00
4 1/2	33.00	37.00	3.00
5	37.00	41.00	3.00
6	44.00	50.00	3.00
7	54.00	61.00	6.00
8	63.00	70.00	6.00
9	76.00	83.00	8.00
10	88.00	97.00	8.00
12	110.00	120.00	10.00
14	148.00	160.00	12.00
15	165.00	177.00	13.00
16	190.00	205.00	15.00

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{16}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

Sizes above 16 inches, prices on application.

### FLANGED BASE TEES MADE TO ORDER

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

EXTRA HEAVY  
CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES

FOR WATER WORKING PRESSURES, SEE PAGE A



FLANGED LONG RADIUS ELBOWS  
No. 127 D

Size  Inches	No. 127 D		
	Faced  Each	Faced, Drilled and Spot Faced	Radius  Inches
2	14.00	17.00	5¼
2½	16.00	19.00	5⅝
3	18.00	22.00	6¼
3½	22.00	26.00	6⅞
4	25.00	29.00	7⅜
4½	30.00	34.00	7¾
5	35.00	39.00	8½
6	42.00	48.00	9⅝
7	52.00	59.00	10⅞
8	63.00	70.00	12
9	72.00	79.00	13
10	83.00	92.00	14⅞
12	105.00	115.00	16½
14	145.00	157.00	18⅞
15	160.00	172.00	20
16	190.00	205.00	21¼
18			23⅝
20			26

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{16}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

Long Radius Elbows of dimensions differing from the above made to order at a special price.

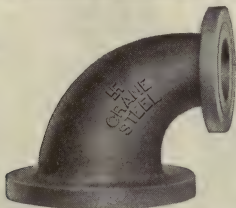
For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

# EXTRA HEAVY CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES

FOR WATER WORKING PRESSURES, SEE PAGE A



## FLANGED REDUCING TAPER ELBOWS

No. 121 D

No. 121 D			No. 121 D		
Size	Faced	Faced, Drilled and Spot Faced	Size	Faced	Faced, Drilled and Spot Faced
Inches	Each		Inches	Each	
2×1¼	14.00	16.00	7×6	43.00	48.00
2×1½	14.00	16.00	8×4	51.00	56.00
2½×1½	16.00	18.00	8×5	51.00	56.00
2½×2	16.00	18.00	8×6	51.00	56.00
3×1½	17.00	20.00	8×7	51.00	56.00
3×2	17.00	20.00	10×5	73.00	79.00
3×2½	17.00	20.00	10×6	73.00	79.00
3½×2	21.00	24.00	10×7		
3½×2½	21.00	24.00	10×8	73.00	79.00
3½×3	21.00	24.00	12×7	93.00	100.00
4×2	23.00	26.00	12×8	93.00	100.00
4×2½	23.00	26.00	12×9	93.00	100.00
4×3	23.00	26.00	12×10	93.00	100.00
4×3½	23.00	26.00	14×6	120.00	128.00
5×2½	29.00	32.00	14×10	120.00	128.00
5×3	29.00	32.00	14×12	120.00	128.00
5×4	29.00	32.00	15×6	135.00	143.00
6×3	35.00	39.00	15×10	135.00	143.00
6×3½	35.00	39.00	15×12	135.00	143.00
6×4	35.00	39.00	16×8	155.00	165.00
6×4½	35.00	39.00	16×10	155.00	165.00
6×5	35.00	39.00	16×12	155.00	165.00
7×4	43.00	48.00	16×14	155.00	165.00
7×5	43.00	48.00			

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS



FOR STEAM  
WORKING  
PRESSURES  
UP TO  
350 POUNDS  
AND A TOTAL  
TEMPERATURE  
OF  
800 DEGREES

FOR WATER  
WORKING  
PRESSURES,  
SEE PAGE A



### FLANGED TEES

#### No. 105 D

### REDUCING FLANGED TEES

REDUCING IN RUN OR BRANCH  
No. 107 D

Size Inches	No. 105 D		No. 107 D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
1¼	13.00	16.00		
1½	14.00	17.00		
2	15.00	18.00	15.00	18.00
2½	17.00	20.00	17.00	20.00
3	19.00	23.00	19.00	23.00
3½	22.00	26.00	22.00	26.00
4	25.00	29.00	25.00	29.00
4½	30.00	34.00	30.00	34.00
5	33.00	37.00	33.00	37.00
6	40.00	46.00	40.00	46.00
7	49.00	56.00	49.00	56.00
8	58.00	65.00	58.00	65.00
9	69.00	76.00	69.00	76.00
10	81.00	90.00	81.00	90.00
12	100.00	110.00	100.00	110.00
14	135.00	147.00	135.00	147.00
15	150.00	162.00	150.00	162.00
16	175.00	190.00	175.00	190.00
18	230.00	245.00	230.00	245.00
20	300.00	320.00	300.00	320.00
22	375.00	405.00	375.00	405.00
24	460.00	490.00	460.00	490.00

The flanges on these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.



## EXTRA HEAVY CAST STEEL FLANGED FITTINGS



FOR STEAM  
WORKING  
PRESSURES  
UP TO  
350 POUNDS  
AND A TOTAL  
TEMPERATURE  
OF  
800 DEGREES

FOR WATER  
WORKING  
PRESSURES,  
SEE PAGE A



SINGLE SWEEP FLANGED TEES

No. 109 D

REDUCING  
SINGLE SWEEP FLANGED TEES  
REDUCING IN RUN OR BRANCH  
No. 111 D

Size Inches	No. 109 D		No. 111 D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
2	16.50	19.50		
2½	19.00	22.00	19.00	22.00
3	21.00	25.00	21.00	25.00
3½	24.00	28.00	24.00	28.00
4	28.00	32.00	28.00	32.00
4½	33.00	37.00	33.00	37.00
5	37.00	41.00	37.00	41.00
6	44.00	50.00	44.00	50.00
7	54.00	61.00	54.00	61.00
8	63.00	70.00	63.00	70.00
9	76.00	83.00	76.00	83.00
10	88.00	97.00	88.00	97.00
12	110.00	120.00	110.00	120.00
14	148.00	160.00	148.00	160.00
15	165.00	177.00	165.00	177.00
16	190.00	205.00	190.00	205.00
18	255.00	270.00	255.00	270.00
20	330.00	350.00	330.00	350.00
22	415.00	445.00	415.00	445.00
24	505.00	535.00	505.00	535.00

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

We do not make Single Sweep Tees with side openings larger than the run.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS



**FOR STEAM  
WORKING  
PRESSURES  
UP TO  
350 POUNDS  
AND A TOTAL  
TEMPERATURE  
OF  
800 DEGREES**

**FOR WATER  
WORKING  
PRESSURES,  
SEE PAGE A**

**DOUBLE SWEEP FLANGED TEES****No. 112 D****REDUCING  
DOUBLE SWEEP FLANGED TEES****No. 112½ D**

Size Inches	No. 112 D		No. 112½ D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
2	16.50	19.50		
2½	19.00	22.00	19.00	22.00
3	21.00	25.00	21.00	25.00
3½	24.00	28.00	24.00	28.00
4	28.00	32.00	28.00	32.00
4½	33.00	37.00	33.00	37.00
5	37.00	41.00	37.00	41.00
6	44.00	50.00	44.00	50.00
7	54.00	61.00	54.00	61.00
8	63.00	70.00	63.00	70.00
9	76.00	83.00	76.00	83.00
10	88.00	97.00	88.00	97.00
12	110.00	120.00	110.00	120.00
14	148.00	160.00	148.00	160.00
15	165.00	177.00	165.00	177.00
16	190.00	205.00	190.00	205.00
18	255.00	270.00	255.00	270.00
20	330.00	350.00	330.00	350.00
22	415.00	445.00	415.00	445.00
24	505.00	535.00	505.00	535.00

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price See page 717.

Double Sweep Tees are not made regularly reducing on the run. If such Fittings are wanted we will make them to order at a special price.

We can make outlet or branch larger than run only within a reasonable limit, depending upon our pattern dimensions.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS

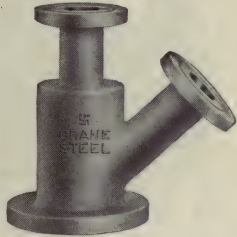
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES

FOR WATER WORKING PRESSURES, SEE PAGE A



**FLANGED LATERALS**

**No. 117 D**



**REDUCING FLANGED LATERALS**

REDUCING IN RUN OR BRANCH  
**No. 119 D**

Size Inches	No. 117 D		No. 119 D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
2	21.00	25.00		
2½	25.00	29.00		
3	27.00	33.00		
3½	32.00	38.00		
4	36.00	42.00	36.00	42.00
4½	42.00	48.00	42.00	48.00
5	45.00	51.00	45.00	51.00
6	55.00	63.00	55.00	63.00
7	68.00	78.00	68.00	78.00
8	81.00	91.00	81.00	91.00
9	100.00	110.00	100.00	110.00
10	115.00	127.00	115.00	127.00
12	145.00	160.00	145.00	160.00
14	190.00	205.00	190.00	205.00
15	210.00	225.00	210.00	225.00
16	245.00	265.00	245.00	265.00
18	320.00	340.00	320.00	340.00
20	400.00	430.00		
22	510.00	550.00		
24	635.00	675.00		

The flanges on these Fittings are regularly furnished with a raised face  $\frac{1}{16}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

For general dimensions, see pages 706 to 709.

For drilling templates, see page 652.

**EXTRA HEAVY  
CAST STEEL FLANGED FITTINGS**  
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES  
FOR WATER WORKING PRESSURES, SEE PAGE A



**FLANGED CROSSES  
No. 113 D**



**REDUCING FLANGED CROSSES  
No. 115 D**

Size Inches	No. 113 D		No. 115 D	
	Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
1¼	17.00	21.00		
1½	19.00	23.00		
2	21.00	25.00	21.00	25.00
2½	25.00	29.00	25.00	29.00
3	27.00	33.00	27.00	33.00
3½	32.00	38.00	32.00	38.00
4	36.00	42.00	36.00	42.00
4½	42.00	48.00	42.00	48.00
5	45.00	51.00	45.00	51.00
6	55.00	63.00	55.00	63.00
7	68.00	78.00	68.00	78.00
8	81.00	91.00	81.00	91.00
9	100.00	110.00	100.00	110.00
10	115.00	127.00	115.00	127.00
12	145.00	160.00	145.00	160.00
14	190.00	205.00	190.00	205.00
15	210.00	225.00	210.00	225.00
16	245.00	265.00	245.00	265.00
18	320.00	340.00	320.00	340.00
20	400.00	430.00	400.00	430.00
22	510.00	550.00	510.00	550.00
24	635.00	675.00	635.00	675.00

The flanges on these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price. See page 717.

For general dimensions, see pages 706 to 709. For drilling templates, see page 652.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS

**FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A  
TOTAL TEMPERATURE OF 800 DEGREES**

**FOR WATER WORKING PRESSURES, SEE PAGE A**



**FLANGED  
TAPER REDUCERS  
No. 123 D**



**FLANGED ECCENTRIC  
TAPER REDUCERS  
No. 123½ D**

Size Inches	Size Inches	Size Inches	Size Inches
3×2	7×5	14×8	20×12
3½×2½	7×6	14×10	20×14
4×2	8×3	14×12	20×16
4×2½	8×4	15×8	20×18
4×3	8×5	15×10	22×14
5×2	8×6	15×12	22×16
5×2½	10×4	15×14	22×18
5×3	10×5	16×8	22×20
5×4	10×6	16×10	24×16
6×3	10×8	16×12	24×18
6×3½	12×5	16×14	24×20
6×4	12×6	18×10	24×22
6×5	12×8	18×12	
7×3	12×10	18×14	
7×4	14×6	18×16	

**Made to order. Prices on application.**

The flanges of these Fittings are regularly furnished with a raised face  $\frac{1}{8}$  inch inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines at an extra price. See page 717.

Flanged Taper Reducers in accordance with special dimensions made to order. Prices on application.

Templates for drilling, page 652.



## EXTRA HEAVY HYDRAULIC CAST STEEL FLANGED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE



**No. 271 D  
ELBOWS**



**No. 273 D  
45° ELBOWS**

FURNISHED MALE OR FEMALE AS ORDERED

Size  Inches	Inside Diameter of Port  Inches	No. 271 D ELBOWS		No. 273 D 45° ELBOWS	
		Faced  Each	Faced, Drilled and Spot Faced	Faced  Each	Faced, Drilled and Spot Faced
1½	1¼	29.00	32.50	29.00	32.50
2	1½	31.50	35.00	31.50	35.00
2½	2	35.00	40.00	35.00	40.00
3	2½	42.50	47.50	42.50	47.50
4	3	51.50	57.50	51.50	57.50
5	4	68.50	77.50	68.50	77.50
6	5	80.00	90.00	80.00	90.00

### WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are **NOT** recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

Fittings for Air or Gas are **SPECIAL**. See explanatory notes on page 153.

The inside diameter of these Fittings is approximately the same as that of Double Extra Strong Pipe.

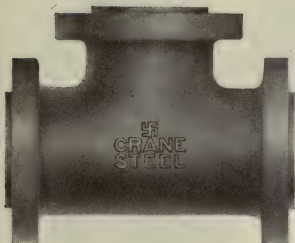
Other sizes made to order. Prices on application.

For dimensions, see page 712. Templates for drilling, page 654.

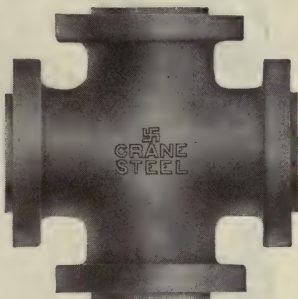
## EXTRA HEAVY HYDRAULIC CAST STEEL FLANGED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

TESTED TO 3000 POUNDS HYDRAULIC PRESSURE



**No. 275 D  
TEES**



**No. 279 D  
CROSSES**

FURNISHED MALE OR FEMALE AS ORDERED

Size	Inside Diam- eter of Port	No. 275 D TEES		No. 277 D REDUCING TEES		No. 279 D CROSSES		No. 280 D REDUCING CROSSES	
		Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced	Faced	Faced, Drilled and Spot Faced
Ins.	Ins.	Each		Each		Each		Each	
1½	1¼	35.00	40.00	35.00	40.00	53.00	60.00	53.00	60.00
2	1½	37.50	42.50	37.50	42.50	57.00	64.00	57.00	64.00
2½	2	41.00	48.00	41.00	48.00	62.00	72.00	62.00	72.00
3	2½	48.00	55.00	48.00	55.00	72.00	82.00	72.00	82.00
4	3	58.50	67.50	58.50	67.50	88.00	100.00	88.00	100.00
5	4	78.00	90.00	78.00	90.00	117.00	135.00	117.00	135.00
6	5	96.00	110.00	96.00	110.00	145.00	165.00	145.00	165.00

### WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. See explanatory notes on page 153.

### AIR OR GAS

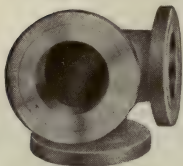
Fittings for Air or Gas are SPECIAL. See explanatory notes on page 153.

The inside diameter of these Fittings is approximately the same as that of Double Extra Strong Pipe.

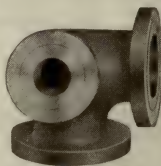
Other sizes made to order. Prices on application.

For dimensions, see page 712. Templates for drilling, page 654.

## EXTRA HEAVY CAST STEEL FLANGED FITTINGS



**FLANGED  
SIDE OUTLET ELBOWS**  
No. 131 D



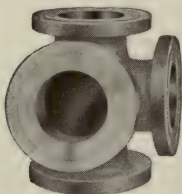
**REDUCING SIDE OUTLET  
FLANGED ELBOWS**  
No. 133 D



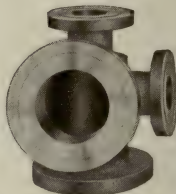
**FLANGED  
DOUBLE BRANCH ELBOWS**  
No. 139 D



**REDUCING DOUBLE BRANCH  
FLANGED ELBOWS**  
No. 141 D



**FLANGED  
SIDE OUTLET TEES**  
No. 135 D



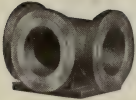
**REDUCING SIDE OUTLET  
FLANGED TEES**  
No. 137 D

THE ABOVE FITTINGS IN SIZES 2 TO 24 INCH MADE TO ORDER ONLY  
PRICES ON APPLICATION

Reducing Side Outlet Elbows are made reducing on the side outlet only. Double Branch Elbows are made reducing only on the run. Dimensions, pages 706 to 709. When ordering or requesting prices, send sketch showing sizes of all openings.

**SPECIAL FLANGED FITTINGS**  
**CAST IRON, FERROSTEEL OR CAST STEEL**  
**LOW PRESSURE, STANDARD AND EXTRA HEAVY PATTERNS**

**ANCHORAGE AND BASE FITTINGS**



**ANCHORAGE TEE**  
**OUTLET AT SIDE**



**ANCHORAGE TEE**  
**OUTLET AT TOP**



**BASE TEE**

**ECCENTRIC FITTINGS**



**FLANGE**  
**TAPPED ECCENTRIC**



**ECCENTRIC TEE**  
**ONE END OF RUN, OR BRANCH, OR**  
**BOTH, MAY BE ECCENTRIC**

**FITTINGS WITH TAPPED BOSSES**



**ELBOW**  
**SHOWING WHERE TAPPED**  
**BOSSES MAY BE LOCATED**



**TEE**  
**SHOWING WHERE TAPPED**  
**BOSSES MAY BE LOCATED**



**SPECIAL**  
**ANGLE ELBOWS**



**RING CLOSING PIECE**  
**FACED ON BOTH SIDES**



**Beveled Filling Ring Faced on**  
**Both Sides for Closing Up**  
**Between Two Flanges Which**  
**Do Not Face Squarely**

**PRICES ON APPLICATION**

Dimension drawings should accompany orders or inquiries for prices.  
 See other designs of Special Flanged Fittings, page 468.

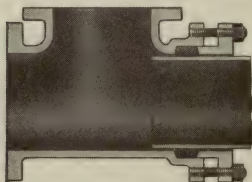
## SPECIAL FLANGED FITTINGS

CAST IRON, FERROSTEEL OR CAST STEEL

LOW PRESSURE, STANDARD AND EXTRA HEAVY PATTERNS



DISTRIBUTING HEADER



EXPANSION TEE FOR EXHAUST LINES ONLY

This Tee is furnished with Gland and Studs and is bored to take Wrought Steel Pipe. Can be furnished with Brass Sleeve when so ordered.



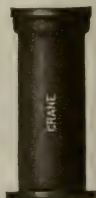
CAST IRON PIPE  
WITH FLANGE  
AND SPIGOT



CAST IRON TEE WITH FLANGE AND HUB ON  
ENDS OF RUN AND SCREWED OUTLET



SPECIAL LENGTHS OF CAST  
IRON FLANGED PIPE



CAST IRON PIPE  
WITH FLANGE  
AND HUB

The above illustrations show a few of the many special patterns we are called upon to furnish. We have exceptional facilities for making any required designs and for all purposes.

### PRICES ON APPLICATION

Dimension drawings should accompany orders or inquiries for prices. See other designs of Special Flanged Fittings, page 467.



ON THE FOLLOWING PAGES

WE LIST

A COMPLETE LINE OF

**VALVES AND FITTINGS**

FOR

**AMMONIA**

## VALVES AND FITTINGS

### FOR AMMONIA

---

**T**HE valves and fittings for Ammonia illustrated on the following pages were designed in accordance with the most approved engineering practice as to standards, interchangeability of parts, proportions, thickness of metal, etc., no attempt being made to utilize old patterns and tools.

Flanges, flanged valves and flanged fittings, one inch and larger, are drilled in multiples of four, so that fittings may be made to face in any quarter; bolt holes straddle center line.

Bolt circles and number and sizes of bolts, are the American extra heavy standard, adopted by all the leading manufacturers September 17, 1913. This conforms to our past practice, there being no changes in the flanges of our ammonia line.

Valves, elbows, tees and crosses of the same type and size, have same center to end dimensions. A tongue and groove globe valve, for example, may be substituted for a tongue and groove tee or cross, a tongue and groove angle valve for a tongue and groove elbow, etc. (See dimension table, page 725.)

The trimmings of valves are standardized so that the bonnet of a globe valve may be placed on an angle or a cross valve body, and vice versa. The trimmings of any size valve are the same, whatever the end connections of the valve may be.

Bolted bonnets were adopted because our experience of over half a century in the manufacture of valves has demonstrated beyond any question that for ammonia, bolted bonnets are in every way superior to screwed bonnets.

Valves have special metal disc rings, plated steel stems with Acme threads and liberal stuffing-boxes, chamfered at top and bottom.

Valves may be repacked under pressure when wide open, the shoulder on the stem closing against the seat on bottom of bonnet, forming a tight joint.

CRANE valves and fittings for ammonia are suitable for working pressures for which they are marked, and are subjected to an air-under-water test of 300 pounds. We have tested different sizes of ammonia valves to 4,000 pounds without breaking.

**ALL CRANE VALVES AND FLANGED FITTINGS FOR  
AMMONIA ARE MADE OF FERROSTEEL,**

a close-grained metal developed by our metallurgists especially for use where working conditions are severe. The tensile strength of Ferrosteel averages 33,500 pounds, and test bars, taken regularly at short intervals, show a remarkable uniformity, the variation from the average being only about five per cent either way.

CRANE malleable iron, the metal used in the manufacture of our screwed ammonia fittings, has an average tensile strength of 37,000 pounds, and is very uniform in strength and quality. The smaller sizes of Crane malleable fittings (two inches and under) have been tested frequently to 8,000 pounds without breaking, and the larger sizes have frequently withstood 3,500 pounds.

Constant analyses and tests are being made to insure uniformity of product.

We can furnish any of the valves and fittings illustrated in this catalogue made in cast steel. Prices upon application.

Any of the valves and fittings illustrated will be supplied galvanized, if desired. Prices upon application.

**ANY INFORMATION IN ADDITION TO THAT GIVEN IN THIS  
CATALOGUE REGARDING OUR LINE OF VALVES AND FITTINGS  
FOR AMMONIA WILL BE SUPPLIED PROMPTLY.**

## **CRANE VALVES AND FITTINGS FOR AMMONIA**

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### **POINTS OF SUPERIORITY**

(SEE CUT ON OPPOSITE PAGE)

---

- (A) Deep stuffing box, holding five rings of packing.
  - (B) When valve is wide open the strain comes on the stem instead of the disc.
  - (C) Disc nut is pinned firmly and can not work loose.
  - (D) Disc and nut made to give great strength and durability.
  - (E) Special metal disc ring rolled in and faced, the disc and disc holder practically forming a homogeneous piece of metal.
  - (F) All stems are cold rolled steel, plated.
- 

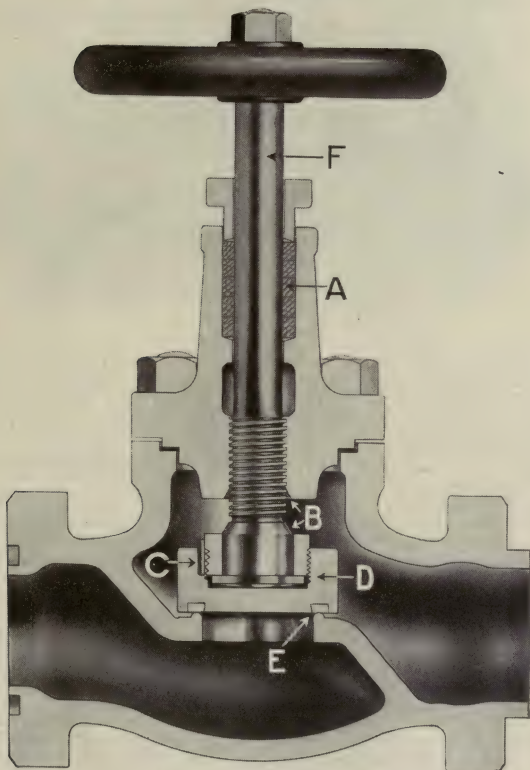
### **AN IMPORTANT FEATURE EXCLUSIVE WITH CRANE AMMONIA GOODS**

With Crane tongue and groove valves and fittings, except Gate valves, it is unnecessary to tear down, cut off and rethread pipe and screw on flanges again when substituting a valve for a fitting, or vice versa. Having the same center-to-end dimensions, globe valves are interchangeable with tees and crosses, and angle valves with elbows, tees and crosses.

Tongue and groove ends are marked T. or G. on the flanges as a guide in placing in the line or making changes.

The American standard for flanged fittings is used, giving Crane Ammonia goods heavier flanges than those of other make.

## CRANE VALVES FOR AMMONIA



No. 1501



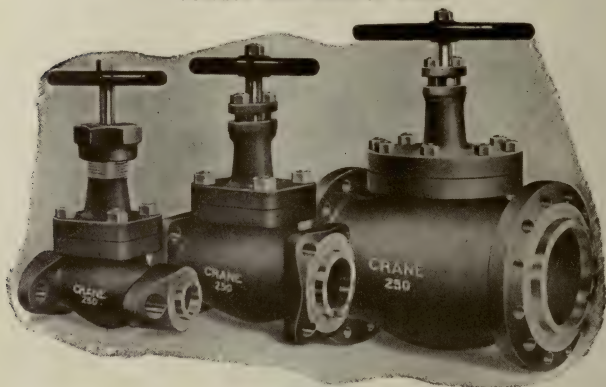
## GLOBE VALVES FOR AMMONIA

FERROSTEEL

SPECIAL METAL DISCS

COLD ROLLED STEEL STEMS

TONGUE AND GROOVE ENDS



No. 1501

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
No. 1501, without Companion Flanges, Bolts and Gaskets, Each	6.00	6.50	7.00	8.00	9.00	15.00	16.00	19.00	28.50
No. 1501, with Companion Flanges, Bolts and Gaskets... Each	7.50	8.00	8.50	9.50	11.00	18.00	19.00	23.00	34.00

Style of Flanges.....	ROUND								
Size.....Inches	3	3½	4	5	6	7	8	10	12
No. 1501, without Companion Flanges, Bolts and Gaskets, Each	43.20	55.80	72.00	103.20	138.00	168.00	228.00	288.00	420.00
No. 1501, with Companion Flanges, Bolts and Gaskets... Each	53.40	67.80	86.40	121.20	162.00	198.00	264.00	336.00	480.00

Sizes 1½ inch and smaller have malleable iron hand wheels.

Valves, sizes 7, 8, 10 and 12 inch are made with yoke.

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

For dimensions, see pages 722 to 726.

For drilling templates, see page 731.

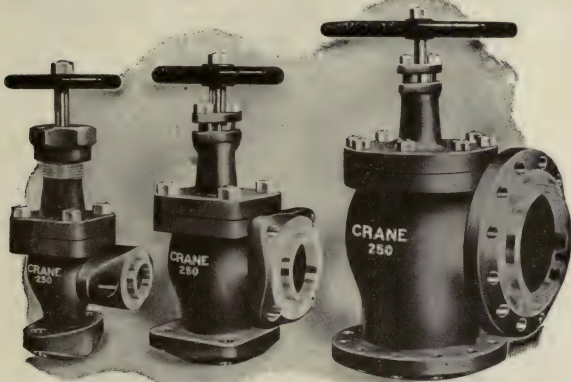
## ANGLE VALVES FOR AMMONIA

FERROSTEEL

SPECIAL METAL DISCS

COLD ROLLED STEEL STEMS

TONGUE AND GROOVE ENDS



No. 1503

Style of Flanges.....	OVAL				SQUARE				
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
No. 1503, without Companion Flanges, Bolts and Gaskets, Each	6.00	6.50	7.00	8.00	9.00	15.00	16.00	19.00	28.50
No. 1503, with Companion Flanges, Bolts and Gaskets... Each	7.50	8.00	8.50	9.50	11.00	18.00	19.00	23.00	34.00

Style of Flanges.....	ROUND							
	3	3 1/2	4	5	6	7	8	10
No. 1503, without Companion Flanges, Bolts and Gaskets, Each	43.20	55.80	72.00	103.20	138.00	168.00	228.00	288.00
No. 1503, with Companion Flanges, Bolts and Gaskets... Each	53.40	67.80	86.40	121.20	162.00	198.00	264.00	336.00

Sizes 1 1/2 inch and smaller have malleable iron hand wheels.  
 Valves, sizes 7, 8, 10 and 12 inch are made with yoke.  
 Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.  
 For dimensions, see pages 722 to 726.  
 For drilling templates, see page 731.

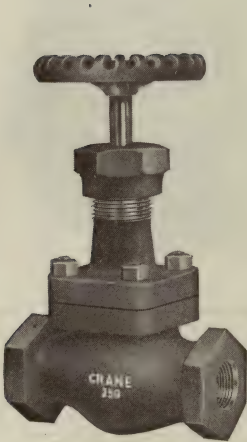
GLOBE AND ANGLE VALVES  
FOR AMMONIA

FERROSTEEL

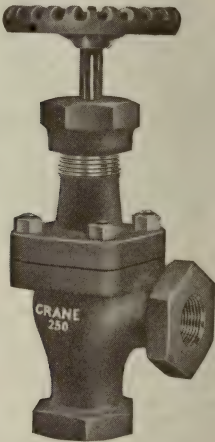
SPECIAL METAL DISCS

COLD ROLLED STEEL STEMS

SCREW END



No. 1504



No. 1505

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1504, Globe, or No. 1505, Angle.....Each	3.50	4.50	5.00	5.50	6.00

Size.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 1504, Globe, or No. 1505, Angle.....Each	7.50	9.00	12.00	16.00	21.00

With the exception of the end connections, these valves are the same construction as the tongue and groove end valves.

For dimensions, see pages 722 to 725.

# NEW PATTERN REGRINDING GLOBE AND ANGLE VALVES FOR AMMONIA

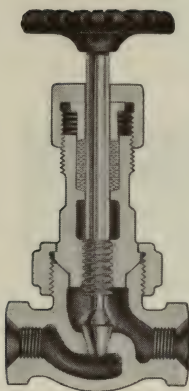
FERROSTEEL

COLD ROLLED STEEL STEM

MALLEABLE UNION RING

SCREW END

WITH UNION BONNET

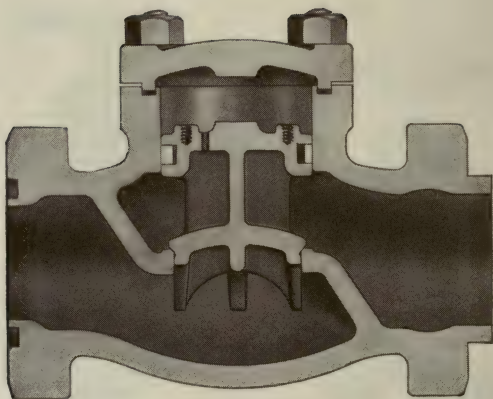
No. 1504 $\frac{1}{2}$ No. 1505 $\frac{1}{2}$ 

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Globe or Angle.....Each	3.00	3.60	4.00	4.40
Center to End, Angle.....Inches	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2
End to End, Globe.....Inches	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4

These valves have a long, tapering, plug seat, which is easily reground.

## IMPROVED CHECK VALVES

FOR AMMONIA



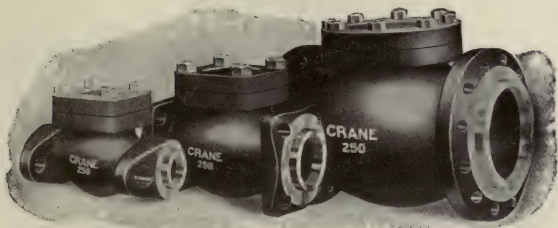
Crane improved check valves for ammonia are constructed with a dash pot which prevents the disc from hammering and thereby eliminates noise in operation.

This construction also greatly increases the durability of the valve.

In case of accident, Crane check valves close promptly, as the back pressure comes squarely on top of the disc.

These valves have full opening.



**HORIZONTAL CHECK VALVES****FOR AMMONIA****FERROSTEEL****TONGUE AND GROOVE ENDS****No. 1507**

Style of Flanges.....	OVAL		SQUARE		
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1507, without Companion Flanges, Bolts and Gaskets, Each	8.70	10.00	11.20	18.50	19.80
No. 1507, with Companion Flanges, Bolts and Gaskets.....Each	10.05	11.30	13.05	21.25	22.55

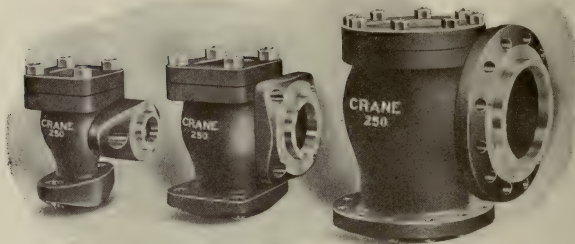
Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1507, without Companion Flanges, Bolts and Gaskets, Each	23.50	34.70	53.50	68.40	89.00	127.00	170.00
No. 1507, with Companion Flanges, Bolts and Gaskets.....Each	27.20	40.20	62.80	79.80	102.30	143.65	192.15

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

Can furnish the above Valves to order, in sizes up to 12 inch. Prices on application.

For dimensions, see page 725.

For drilling templates, see page 731.

**ANGLE CHECK VALVES****FOR AMMONIA****FERROSTEEL****TONGUE AND GROOVE ENDS****No. 1509**

Style of Flanges.....	OVAL		SQUARE		
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1509, without Companion Flanges, Bolts and Gaskets, Each	8.70	10.00	11.20	18.50	19.80
No. 1509, with Companion Flanges, Bolts and Gaskets..... Each	10.05	11.30	13.05	21.25	22.55

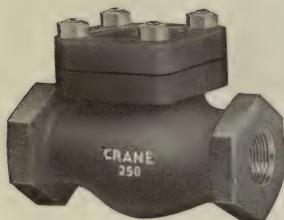
Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1509, without Companion Flanges, Bolts and Gaskets, Each	23.50	34.70	53.50	68.40	89.00	127.00	170.00
No. 1509, with Companion Flanges, Bolts and Gaskets..... Each	27.20	40.20	62.80	79.80	102.30	143.65	192.15

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

Can furnish the above Valves to order, in sizes up to 12 inch. Prices on application.

For dimensions, see page 725.

For drilling templates, see page 731.

**HORIZONTAL AND ANGLE CHECK VALVES****FOR AMMONIA****FERROSTEEL****SCREW END****No. 1507 $\frac{1}{2}$** **No. 1509 $\frac{1}{2}$** 

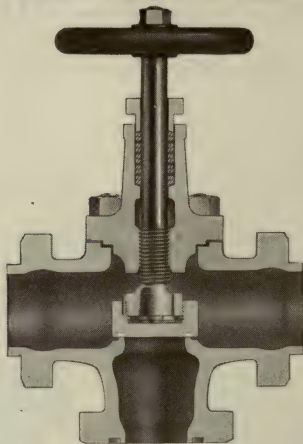
Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1507 $\frac{1}{2}$ , Horizontal, or No. 1509 $\frac{1}{2}$ , Angle.....Each	6.80	7.25	8.00

Size.....Inches	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
No. 1507 $\frac{1}{2}$ , Horizontal, or No. 1509 $\frac{1}{2}$ , Angle.....Each	10.75	12.40	15.40

# CROSS VALVES FOR AMMONIA

FERROSTEEL

SPECIAL METAL DISCS

COLD ROLLED STEEL STEMS  
TONGUE AND GROOVE ENDSNo. 1510 $\frac{1}{2}$ 

Style of Flange.....	OVAL		SQUARE		
	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1510 $\frac{1}{2}$ , without Companion Flanges, Bolts and Gaskets, Each	9.70	11.35	12.40	19.50	20.50
No. 1510 $\frac{1}{2}$ , with Companion Flanges, Bolts and Gaskets, Each	11.60	13.75	16.00	23.25	25.00

Style of Flange.....	SQUARE		ROUND				
	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1510 $\frac{1}{2}$ , without Companion Flanges, Bolts and Gaskets, Each	26.00	36.70	56.00	72.40	93.00	134.00	179.00
No. 1510 $\frac{1}{2}$ , with Companion Flanges, Bolts and Gaskets, Each	31.00	45.70	71.00	89.40	113.00	157.00	209.00

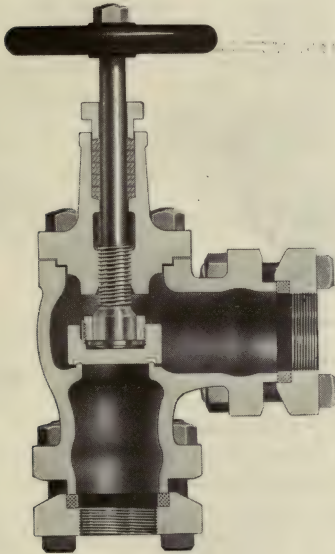
Sizes  $1\frac{1}{2}$  inch and smaller have malleable iron hand wheels.

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

Can furnish the above Valves to order, in sizes up to 12 inch. Prices on application.

For dimensions, see pages 722 to 725.

For drilling templates, see page 731.

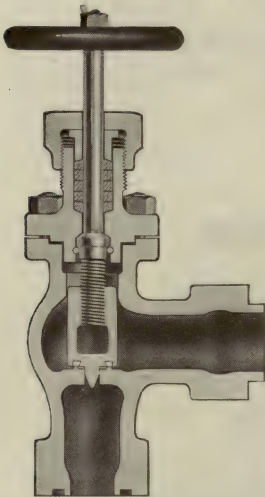
**VALVES AND FITTINGS****FOR AMMONIA****FERROSTEEL****SPECIAL METAL DISCS****COLD ROLLED STEEL STEMS****BOYLE (TONGUE) ENDS**

Valves and fittings with Boyle ends (all ends tongued) will be made to order at the same list prices that apply to similar valves and fittings with tongue and groove end connections.

Either Boyle or groove flanges may be used with valves and fittings with Boyle ends.



## EXPANSION VALVES FOR AMMONIA



**NON-RISING STEM**

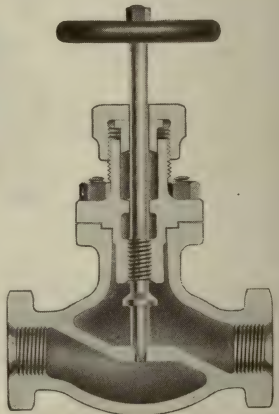
The stems of both styles have very fine threads, permitting the minutest possible adjustment, and are made of cold rolled steel.

All sizes of both styles of expansion valves are furnished either with tongue and groove ends or screw ends. These valves have ferrosteeel bodies and bonnets.

A special indicating type hand wheel is supplied with all Expansion Valves.

We furnish two styles of expansion valves, one of the needle type with non-rising stem and soft-metal seat ring, and the other of the plain needle type with rising stem.

The non-rising stem valve does away with wire drawing, the special metal ring clearing the seat before expansion starts. These valves may be packed under pressure.



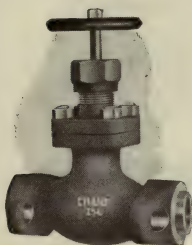
**RIISING STEM**

# NON-RISING STEM GLOBE EXPANSION VALVES FOR AMMONIA

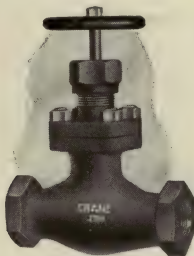
FERROSTEEL

SPECIAL METAL DISC RINGS

COLD ROLLED STEEL STEMS



No. 1511



No. 1519

## TONGUE AND GROOVE ENDS

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1511, without Companion Flanges, Bolts and Gaskets.....Each	6.00	6.50	7.00	8.00	9.00
No. 1511, with Companion Flanges, Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

Unless otherwise specified we will always furnish flanged Valves complete with Companion Flanges, Gaskets and Bolts.

## SCREW ENDS

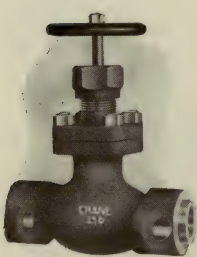
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1519.....Each	4.75	5.50	6.00	6.80	7.50
End to End.....Inches	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	$6\frac{1}{4}$

For dimensions, see pages 722 to 725.

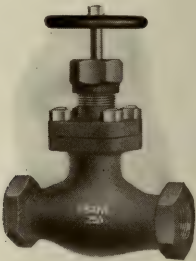
For drilling templates, see page 731.

RISING STEM  
 GLOBE EXPANSION VALVES  
 FOR AMMONIA  
 FERROSTEEL

INTEGRAL COLD ROLLED STEEL STEM AND DISC



No. 1513



No. 1519½

TONGUE AND GROOVE ENDS

Size.....Inches	¼	⅜	½	¾	1
No. 1513, without Companion Flanges, Bolts and Gaskets.....Each	6.00	6.50	7.00	8.00	9.00
No. 1513, with Companion Flanges Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

Unless otherwise specified we will always furnish flanged Valves complete with Companion Flanges, Gaskets and Bolts.

SCREW ENDS

Size.....Inches	¼	⅜	½	¾	1
No. 1519½.....Each	4.75	5.50	6.00	6.80	7.50
End to End.....Inches	4½	4¾	5	5½	6¼

For dimensions, see pages 722 to 725.  
 For drilling templates, see page 731.

# NON-RISING STEM ANGLE EXPANSION VALVES FOR AMMONIA

FERROSTEEL

SPECIAL METAL DISC RINGS

COLD ROLLED STEEL STEMS



No. 1515

No. 1519 $\frac{1}{4}$ 

## TONGUE AND GROOVE ENDS

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1515, without Companion Flanges, Bolts and Gaskets.....Each	6.00	6.50	7.00	8.00	9.00
No. 1515, with Companion Flanges, Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

Unless otherwise specified we will always furnish flanged Valves complete with Companion Flanges, Gaskets and Bolts.

## SCREW ENDS

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1519 $\frac{1}{4}$ .....Each	4.75	5.50	6.00	6.80	7.50
Center to End.....Inches	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$

For dimensions, see pages 722 to 725.

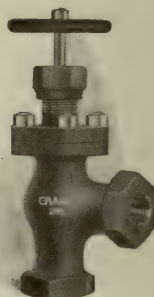
For drilling templates, see page 731.

**RISEING STEM  
ANGLE EXPANSION VALVES  
FOR AMMONIA  
FERROSTEEL**

**INTEGRAL COLD ROLLED STEEL STEM AND DISC**



**No. 1517**



**No. 1519 $\frac{3}{4}$**

**TONGUE AND GROOVE ENDS**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1517, without Companion Flanges, Bolts and Gaskets.....Each	6.00	6.50	7.00	8.00	9.00
No. 1517, with Companion Flanges, Bolts and Gaskets.....Each	7.50	8.00	8.50	9.50	11.00

Unless otherwise specified we will always furnish flanged Valves complete with Companion Flanges, Gaskets and Bolts.

**SCREW ENDS**

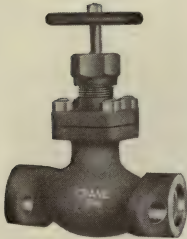
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1519 $\frac{3}{4}$ .....Each	4.75	5.50	6.00	6.80	7.50
Center to End.....Inches	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$

For dimensions, see pages 722 to 725.

For drilling templates, see page 731.



**EXPANSION VALVES  
FOR AMMONIA  
GLOBE AND ANGLE  
FERROSTEEL  
COLD ROLLED STEEL STEMS  
SCREW ENDS WITH GLANDS**



No. 1512



No. 1518

**NON-RISING STEM VALVES  
WITH SPECIAL METAL DISC RINGS**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1512, Globe Valves, with Companion Glands, Bolts and Gaskets.....Each	6.40	7.25	7.75	9.00	10.00
No. 1516, Angle Valves, with Companion Glands, Bolts and Gaskets.....Each	6.40	7.25	7.75	9.00	10.00

**RIISING STEM VALVES  
INTEGRAL STEEL STEM AND DISC**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 1514, Globe Valves, with Companion Glands, Bolts and Gaskets.....Each	6.40	7.25	7.75	9.00	10.00
No. 1518, Angle Valves, with Companion Glands, Bolts and Gaskets.....Each	6.40	7.25	7.75	9.00	10.00

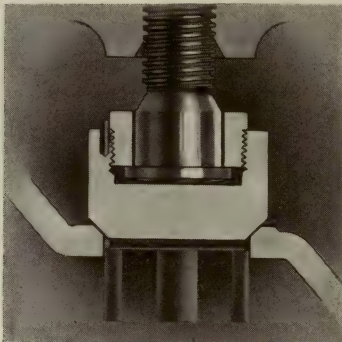
Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

For dimensions, see pages 722 to 725.

For drilling templates, see page 731.

# VALVES FOR AMMONIA WITH ALL-STEEL DISCS

For use on high temperature, we will furnish, on special order, globe, angle and cross valves with case hardened steel discs and beveled seats. In other respects, the valves will be the same as our regular line. The accompanying sectional illustration shows the construction of the disc and seat.



Valves with all-steel discs in 1/4, 3/8 and 1/2 inch sizes, will be supplied at the same prices as similar valves with soft metal seat rings. Sizes, 3/4 to 6 inch, inclusive, will be furnished at the following additional cost over valves with regular metal seat rings:

Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Additional Cost.....Each	1.00	1.30	1.70	2.30	2.65	2.70

Size.....Inches	3	3 1/2	4	5	6
Additional Cost.....Each	5.40	6.30	6.75	8.25	8.80

Sizes, 3/4 inch and larger have guide wings.

In ordering valves with **ALL-STEEL DISCS**, the number and size should be given and "**ALL-STEEL DISC**" specified.

# GLOBE, ANGLE AND CROSS VALVES

## FOR AMMONIA

SPECIAL METAL DISCS      COLD ROLLED STEEL STEMS

# HORIZONTAL AND ANGLE CHECK VALVES

FERROSTEEL      SCREW ENDS WITH GLANDS



No. 1500



No. 1506

Style of Flanges.....	OVAL				SQUARE		
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
Size..... Inches							
No. 1500, Globe Valve, with Companion Glands, Bolts and Gaskets, Each	6.40	7.25	7.75	9.00	10.00	16.50	18.50
No. 1502, Angle Valve, with Companion Glands, Bolts and Gaskets, Each	6.40	7.25	7.75	9.00	10.00	16.50	18.50
No. 1506, Horizontal Check Valve, with Companion Glands, Bolts and Gaskets ..... Each			9.70	10.85	12.50	20.45	21.65
No. 1508, Angle Check Valve, with Companion Glands, Bolts and Gaskets ..... Each			9.70	10.85	12.50	20.45	21.65
No. 1510, Cross Valve, with Companion Glands, Bolts and Gaskets, Each			10.25	12.40	14.50	21.60	23.25

Style of Flange.....	SQUARE				ROUND		
	2	2 1/2	3	3 1/2	4	5	6
Size..... Inches							
No. 1500, Globe Valve, with Companion Glands, Bolts and Gaskets, Each	22.50	34.00	52.80	66.60	82.80	117.60	158.40
No. 1502, Angle Valve, with Companion Glands, Bolts and Gaskets, Each	22.50	34.00	52.80	66.60	82.80	117.60	158.40
No. 1506, Horizontal Check Valve, with Companion Glands, Bolts and Gaskets ..... Each	26.05	38.60	60.40	76.55	97.75	138.00	185.00
No. 1508, Angle Check Valve, with Companion Glands, Bolts and Gaskets ..... Each	26.05	38.60	60.40	76.55	97.75	138.00	185.00
No. 1510, Cross Valve, with Companion Glands, Bolts and Gaskets, Each	29.00	43.60	68.50	86.25	108.25	151.50	205.00

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

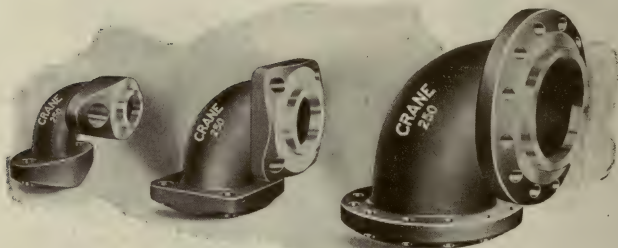
Sizes 1 1/2 inch and smaller have malleable iron hand wheels.

For dimensions, see pages 722 to 725. For drilling templates, see page 731.

# FITTINGS FOR AMMONIA ELBOWS

FERROSTEEL

TONGUE AND GROOVE ENDS



No. 1521

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 1521, without Companion Flanges, Bolts and Gaskets... Each	1.00	1.25	1.40	1.75	2.00	2.25	2.50	3.00	5.50
No. 1521, with Companion Flanges, Bolts and Gaskets... Each	2.00	2.40	2.45	2.75	3.50	4.75	5.00	6.00	11.00

Style of Flanges.....	ROUND								
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
No. 1521, without Companion Flanges, Bolts and Gaskets... Each	10.00	13.50	15.00	20.00	30.00	42.00	55.00	70.00	95.00
No. 1521, with Companion Flanges, Bolts and Gaskets... Each	13.50	17.00	21.00	28.50	40.00	55.00	70.00	90.00	115.00

Unless otherwise specified we will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts.

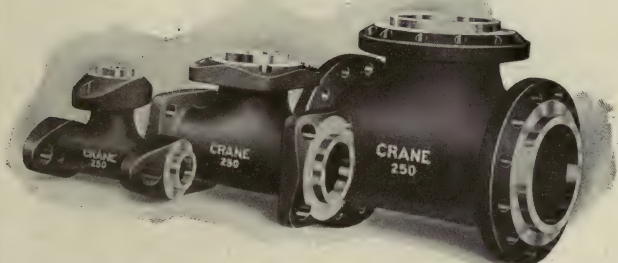
For dimensions, see page 725.

For drilling templates, see page 731.

# FITTINGS FOR AMMONIA TEES

FERROSTEEL

TONGUE AND GROOVE ENDS



No. 1523

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	¼	⅜	½	¾	1	1¼	1½	2	2½
No. 1523, without Companion Flanges, Bolts and Gaskets... Each	1.50	1.75	1.95	2.20	2.50	3.70	3.75	4.00	8.00
No. 1523, with Companion Flanges, Bolts and Gaskets... Each	2.75	3.10	3.50	4.25	4.75	7.50	7.55	8.00	15.00

Style of Flanges.....	ROUND								
Size.....Inches	3	3½	4	5	6	7	8	10	12
No. 1523, without Companion Flanges, Bolts and Gaskets... Each	17.00	21.00	23.50	29.00	36.00	50.00	65.00	85.00	120.00
No. 1523, with Companion Flanges, Bolts and Gaskets... Each	26.00	31.00	34.50	43.00	53.00	70.00	95.00	130.00	170.00

Unless otherwise specified we will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts.

For dimensions, see page 725.

For drilling templates, see page 731.



## REDUCING TEES

### TONGUE AND GROOVE ENDS

SIZE INCHES.	No. 1525, without Companion Flanges, Bolts and Gaskets. Each.	No. 1525, with Companion Flanges, Bolts and Gaskets. Each.
$\frac{1}{2}$ x $\frac{3}{8}$ .....	2.00	3.50
$\frac{1}{2}$ x $\frac{3}{4}$ .....	2.00	3.75
$\frac{3}{4}$ x $\frac{1}{2}$ .....	3.50	5.50
1 x $\frac{1}{2}$ .....	3.50	6.10
$1\frac{1}{4}$ x $\frac{1}{2}$ .....	3.75	7.00
$1\frac{1}{4}$ x $\frac{3}{4}$ .....	3.75	7.00
$1\frac{1}{4}$ x 2.....	3.75	8.00
$1\frac{1}{2}$ x $\frac{1}{2}$ .....	3.75	7.00
$1\frac{1}{2}$ x $\frac{3}{4}$ .....	3.75	7.00
$1\frac{1}{2}$ x $1\frac{1}{4}$ .....	3.75	7.00
$1\frac{1}{2}$ x 2.....	3.75	8.00
$1\frac{1}{2}$ x $2\frac{1}{2}$ .....	3.75	8.75
2 x $\frac{1}{2}$ .....	4.00	8.00
2 x $\frac{3}{4}$ .....	4.00	8.00
2 x 1.....	4.00	8.00
2 x $1\frac{1}{4}$ .....	4.00	8.00
2 x $1\frac{1}{2}$ .....	4.00	8.00
2 x $2\frac{1}{2}$ .....	5.50	11.50
2 x 3.....	8.25	14.50
$2\frac{1}{2}$ x $1\frac{1}{4}$ .....	7.00	13.00
$2\frac{1}{2}$ x $1\frac{1}{2}$ .....	7.00	13.00
$2\frac{1}{2}$ x 2.....	7.25	13.25
$2\frac{1}{2}$ x 3.....	12.25	19.40
3 x $1\frac{1}{4}$ .....	14.50	22.50
3 x 2.....	14.50	22.50
3 x $2\frac{1}{2}$ .....	15.30	24.50
3 x 4.....	21.55	33.70
$3\frac{1}{2}$ x 2.....	18.00	26.30
$3\frac{1}{2}$ x $2\frac{1}{2}$ .....	19.00	28.65
$3\frac{1}{2}$ x 3.....	22.50	33.75
4 x 2.....	20.60	30.00
4 x $2\frac{1}{2}$ .....	21.30	31.40
4 x 3.....	25.30	35.60
5 x 2.....	22.25	34.90
5 x $2\frac{1}{2}$ .....	23.60	36.20
5 x 3.....	27.80	40.60
5 x 4.....	30.75	45.20
6 x $2\frac{1}{2}$ .....	41.50	61.00
6 x 4.....	41.50	64.00

Size of opening determines style of flange, viz; openings  $\frac{1}{4}$  to  $\frac{3}{4}$  have oval flanges; 1 to  $2\frac{1}{2}$ , square; 3 to 6, round.

For dimensions, see page 725. For drilling templates, see page 731.

# FITTINGS FOR AMMONIA CROSSES

FERROSTEEL

TONGUE AND GROOVE ENDS



No. 1527

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 1527, without Companion Flanges, Bolts and Gaskets... Each	1.75	2.40	2.50	3.00	3.30	4.95	5.00	6.00	10.00
No. 1527, with Companion Flanges, Bolts and Gaskets... Each	3.60	4.25	4.75	5.30	5.80	9.95	10.00	11.50	18.25

Style of Flanges.....	ROUND								
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
No. 1527, without Companion Flanges, Bolts and Gaskets... Each	23.00	26.00	30.00	38.00	47.00	65.00	85.00	110.00	150.00
No. 1527, with Companion Flanges, Bolts and Gaskets... Each	31.00	37.00	44.00	53.00	65.00	90.00	125.00	165.00	220.00

Unless otherwise specified we will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts.

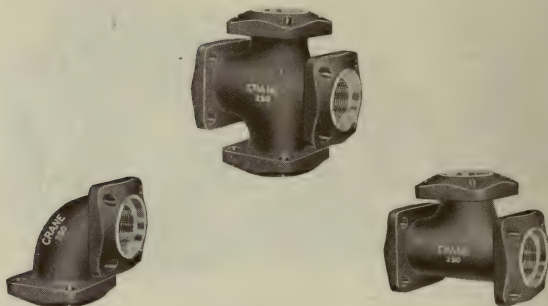
For dimensions, see page 725.

For drilling templates, see page 731.

# FITTINGS FOR AMMONIA ELBOWS, TEES AND CROSSES

FERROSTEEL

SCREW ENDS WITH GLANDS



Style of Flanges.....	OVAL				SQUARE		
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1520, Elbows, with Companion Glands, Bolts and Gaskets, Each	2.00	2.40	2.45	2.75	3.50	4.75	5.00
No. 1522, Tees, with Companion Glands, Bolts and Gaskets, Each	2.75	3.10	3.50	4.25	4.75	7.50	7.55
No. 1526, Crosses, with Companion Glands, Bolts and Gaskets, Each	3.60	4.25	4.75	5.30	5.80	9.95	10.00

Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1520, Elbows, with Companion Glands, Bolts and Gaskets, Each	6.00	11.00	13.50	17.00	21.00	28.50	40.00
No. 1522, Tees, with Companion Glands, Bolts and Gaskets, Each	8.00	15.00	26.00	31.00	34.50	43.00	53.00
No. 1526, Crosses, with Companion Glands, Bolts and Gaskets, Each	11.50	18.25	31.00	37.00	44.00	53.00	65.00

Unless otherwise specified we will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts.

For dimensions, see page 725.

For drilling templates, see page 731.

# **MALLEABLE IRON FITTINGS** **FOR AMMONIA**

**SCREW ENDS WITH SOLDERING RECESS**



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1530, Elbows.....Each	.20	.25	.30	.35	.40	.55	.70
No. 1532, 45° Elbows.....Each	.25	.30	.35	.42	.50	.65	.85
No. 1534, Tees.....Each	.30	.40	.45	.50	.60	.80	1.05
No. 1538, Crosses.....Each	.60	.80	.90	1.00	1.20	1.60	2.10
No. 1540, Solid Plugs, Cast Iron, Ea.	.04	.04	.04	.06	.08	.09	.11
No. 1542, Hollow Plugs, Cast Iron, Ea.	.02	.02	.02	.03	.04	.05	.07

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1530, Elbows.....Each	.90	1.50	2.40	3.25	4.25	6.50	9.50
No. 1532, 45° Elbows.....Each	1.10	1.85	2.85	4.00	5.00		
No. 1534, Tees.....Each	1.35	2.25	3.60	5.00	6.50	9.75	14.25
No. 1538, Crosses.....Each	2.70	4.50	7.20	10.00	13.00	19.50	28.50
No. 1540, Solid Plugs, Cast Iron, Ea.	.15	.27	.38	.57	.63	1.35	1.80
No. 1542, Hollow Plugs, Cast Iron, Ea.	.10	.18	.25	.38	.42	.88	1.20

Reducing sizes Elbows, Tees and Crosses will be furnished at 15 per cent. advance over straight sizes.

For list of sizes of reducing fittings carried in stock, see page 498.

## **REDUCING COUPLINGS No. 1539**

**CARRIED IN STOCK**

Size.....Inches	$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times 1$	$2 \times \frac{1}{2}$	$2 \times 1$	$2 \times 1\frac{1}{4}$
Price.....Each	.30	.40	.45	.45	.55	.55	.70	.70	.70

## LIST OF SIZES

# MALLEABLE IRON

## REDUCING FITTINGS

### FOR AMMONIA

CARRIED IN STOCK

## REDUCING ELBOWS

$\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x 1	2 x $1\frac{1}{2}$
1 x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{4}$	$2\frac{1}{2}$ x 2
$1\frac{1}{4}$ x $\frac{1}{2}$	2 x $\frac{1}{2}$	3 x $2\frac{1}{2}$
$1\frac{1}{4}$ x $\frac{3}{4}$	2 x $\frac{3}{4}$	

## REDUCING TEES

$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$	3 x 3 x 2
1 x 1 x $\frac{3}{4}$	2 x 2 x $1\frac{1}{2}$	3 x 2 x 3
1 x 1 x $\frac{1}{2}$	2 x 2 x $1\frac{1}{4}$	4 x 4 x 3
1 x $\frac{3}{4}$ x 1	2 x 2 x 1	4 x 4 x 2
$1\frac{1}{4}$ x $1\frac{1}{4}$ x 1	2 x 2 x $\frac{3}{4}$	4 x 3 x 4
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{4}$	2 x 2 x $\frac{1}{2}$	6 x 6 x 4
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{2}$	2 x $1\frac{1}{2}$ x 2	6 x 6 x 3
$1\frac{1}{4}$ x 1 x $1\frac{1}{4}$	$2\frac{1}{2}$ x $2\frac{1}{2}$ x 2	
$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{4}$	$2\frac{1}{2}$ x 2 x $2\frac{1}{2}$	

The above Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand.

Reducing sizes Elbows, Tees and Crosses will be furnished at 15 per cent. advance over straight sizes.



# COMPANION FLANGES

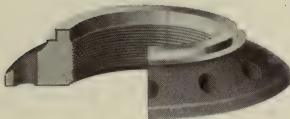
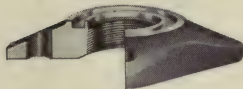
FOR AMMONIA

MALLEABLE IRON

TONGUE



GROOVE



No. 1547 TONGUE

No. 1545 GROOVE

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 1545, without Bolts or Gasket.....Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1545, with Bolts and Gasket.....Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00
No. 1547, without Bolts or Gasket.....Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1547, with Bolts and Gasket.....Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00

Style of Flanges.....	ROUND								
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
No. 1545, without Bolts or Gasket.....Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1545, with Bolts and Gasket.....Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50
No. 1547, without Bolts or Gasket.....Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1547, with Bolts and Gasket.....Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50

For dimensions, see page 731.

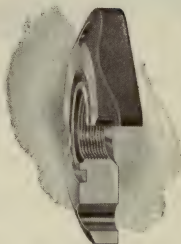
Templates for drilling, page 731.

## REDUCING COMPANION FLANGES

TONGUE

GROOVE

BOYLE



No. 1549 MALLEABLE

No. 1551 MALLEABLE

No. 1554 FERROSTEEL

SIZE. INCHES.	STYLE OF FLANGE.	TONGUE, No. 1549.		GROOVE, No. 1551.		BOYLE, No. 1554.	
		Without Bolts and Gasket. Each.	With Bolts and Gasket. Each.	Without Bolts and Gasket. Each.	With Bolts and Gasket. Each.	Without Bolts and Gasket. Each.	With Bolts and Gasket. Each.
$\frac{3}{8}$ x $\frac{1}{4}$ .....	OVAL	.45	.55	.45	.55	.45	.55
$\frac{1}{2}$ x $\frac{3}{8}$ .....		.50	.70	.50	.70	.50	.70
$\frac{1}{2}$ x $\frac{1}{4}$ .....		.50	.70	.50	.70	.50	.70
$\frac{3}{4}$ x $\frac{1}{2}$ .....		.65	.90	.65	.90	.65	.90
$\frac{3}{4}$ x $\frac{3}{8}$ .....		.65	.90	.65	.90	.65	.90
$\frac{3}{4}$ x $\frac{1}{4}$ .....		.65	.90	.65	.90	.65	.90
1 x $\frac{3}{4}$ .....	SQUARE	.95	1.20/	.95	1.20	.95	1.20
1 x $\frac{1}{2}$ .....		.95	1.20	.95	1.20	.95	1.20
1 x $\frac{3}{8}$ .....		.95	1.20	.95	1.20	.95	1.20
1 x $\frac{1}{4}$ .....		.95	1.20	.95	1.20	.95	1.20
$1\frac{1}{4}$ x 1.....		1.00	1.25	1.00	1.25	1.00	1.25
$1\frac{1}{4}$ x $\frac{3}{4}$ .....		1.00	1.25	1.00	1.25	1.00	1.25
$1\frac{1}{4}$ x $\frac{1}{2}$ .....		1.00	1.25	1.00	1.25	1.00	1.25

## SQUARE

1 1/4 x 3/8.....	1.00	1.25	1.00	1.25	1.00	1.25
1 1/4 x 1/4.....	1.00	1.25	1.00	1.25	1.00	1.25
1 1/2 x 1 1/4.....	1.20	1.50	1.20	1.50	1.20	1.50
1 1/2 x 1.....	1.20	1.50	1.20	1.50	1.20	1.50
1 1/2 x 3/4.....	1.20	1.50	1.20	1.50	1.20	1.50
2 x 1 1/2.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1 1/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 3/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1/2.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 3/8.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 1/2 x 2.....	2.50	3.00	2.50	3.00	2.50	3.00
2 1/2 x 1 1/2.....	2.50	3.00	2.50	3.00	2.50	3.00
2 1/2 x 1 1/4.....	2.50	3.00	2.50	3.00	2.50	3.00
3 x 2 1/2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 x 2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 x 1 1/2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 1/2 x 3.....	3.50	4.25	3.50	4.25	3.50	4.25
3 1/2 x 2 1/2.....	3.50	4.25	3.50	4.25	3.50	4.25
3 1/2 x 2.....	3.50	4.25	3.50	4.25	3.50	4.25
4 x 3 1/2.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 3.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 2 1/2.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 2.....	4.25	5.00	4.25	5.00	4.25	5.00
5 x 4.....	5.25	5.75	5.25	5.75	5.25	5.75
5 x 3 1/2.....	5.25	5.75	5.25	5.75	5.25	5.75
6 x 5.....	6.25	7.50	6.25	7.50	6.25	7.50
6 x 4.....	6.25	7.50	6.25	7.50	6.25	7.50

## ROUND

1 1/4 x 3/8.....	1.00	1.25	1.00	1.25	1.00	1.25
1 1/4 x 1/4.....	1.00	1.25	1.00	1.25	1.00	1.25
1 1/2 x 1 1/4.....	1.20	1.50	1.20	1.50	1.20	1.50
1 1/2 x 1.....	1.20	1.50	1.20	1.50	1.20	1.50
1 1/2 x 3/4.....	1.20	1.50	1.20	1.50	1.20	1.50
2 x 1 1/2.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1 1/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 3/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1/2.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 3/8.....	1.40	1.70	1.40	1.70	1.40	1.70
2 x 1/4.....	1.40	1.70	1.40	1.70	1.40	1.70
2 1/2 x 2.....	2.50	3.00	2.50	3.00	2.50	3.00
2 1/2 x 1 1/2.....	2.50	3.00	2.50	3.00	2.50	3.00
2 1/2 x 1 1/4.....	2.50	3.00	2.50	3.00	2.50	3.00
3 x 2 1/2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 x 2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 x 1 1/2.....	3.00	3.75	3.00	3.75	3.00	3.75
3 1/2 x 3.....	3.50	4.25	3.50	4.25	3.50	4.25
3 1/2 x 2 1/2.....	3.50	4.25	3.50	4.25	3.50	4.25
3 1/2 x 2.....	3.50	4.25	3.50	4.25	3.50	4.25
4 x 3 1/2.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 3.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 2 1/2.....	4.25	5.00	4.25	5.00	4.25	5.00
4 x 2.....	4.25	5.00	4.25	5.00	4.25	5.00
5 x 4.....	5.25	5.75	5.25	5.75	5.25	5.75
5 x 3 1/2.....	5.25	5.75	5.25	5.75	5.25	5.75
6 x 5.....	6.25	7.50	6.25	7.50	6.25	7.50
6 x 4.....	6.25	7.50	6.25	7.50	6.25	7.50

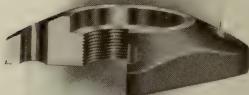
# COMPANION GLANDS AND BOYLE FLANGES

FOR AMMONIA

FERROSTEEL



No. 1544  
COMPANION GLAND



No. 1553  
BOYLE FLANGE

## NO. 1544 COMPANION GLANDS

Style of Flanges.....	OVAL				SQUARE		
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, with Bolts and Gaskets, Each	.50	.55	.70	.90	1.20	1.25	1.50

Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, with Bolts and Gaskets, Each	1.70	3.00	3.75	4.25	5.00	5.75	7.50

## NO. 1553 BOYLE FLANGES

Style of Flanges.....	OVAL				SQUARE		
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, with Bolts and Gaskets, Each	.50	.55	.70	.90	1.20	1.25	1.50

Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, with Bolts and Gaskets, Each	1.70	3.00	3.75	4.25	5.00	5.75	7.50

For dimensions, see page 731.

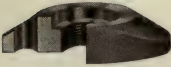
For drilling templates, see page 731.

# SPECIAL COMPANION FLANGES AND GLANDS

## FOR AMMONIA

### FOR DOUBLE PIPE RETURN BENDS AND SPECIAL REDUCING TEES

#### BOYLE

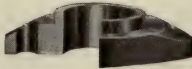


No. 1583 FERROSTEEL



No. 1584 FERROSTEEL

#### GLAND



No. 1582 FERROSTEEL

#### TONGUE



No. 1582½ MALLEABLE

#### GROOVE



No. 1583½ MALLEABLE

Style of Flanges.....	OVAL		SQUARE		RECTANGULAR	
	1¼	2	2	3	2	2½
Size.....Inches						
No. 1582, Gland, without Bolts and Gasket.....Each	.60	.85				
No. 1582, Gland, with Bolts and Gasket.....Each	.75	1.00				
No. 1582½ Tongue Flange, without Bolts and Gaskets.....Each			.85			
No. 1582½, Tongue Flange, with Bolts and Gaskets.....Each			1.00			
No. 1583, Boyle Flange, without Bolts and Gasket.....Each	.60	.85	.85	1.80		
No. 1583, Boyle Flange, with Bolts and Gasket.....Each	.75	1.00	1.00	2.25		
No. 1583½, Groove Flange, without Bolts and Gasket.....Each			.85			
No. 1583½, Groove Flange, with Bolts and Gasket.....Each			1.00			
No. 1584, Boyle Flange, without Bolts and Gasket.....Each					1.50	1.50
No. 1584, Boyle Flange, with Bolts and Gasket.....Each					1.80	1.80

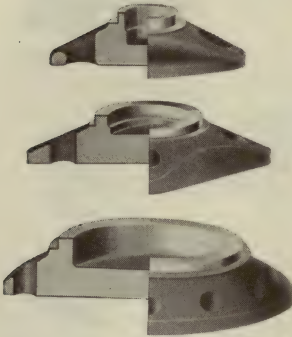
No. 1582 special oval glands are used on double pipe return bends for condensers and brine coolers; 2-inch oval glands are also used on 2 x 4½ inch return bends with screw-gland ends.

No. 1583 special square Boyle flanges are used on double pipe return bends for condensers and brine coolers and on special reducing tees; the 1583½ 2-inch special square groove flange in addition to being used on 2 x 4½ inch return bends with tongue and groove ends, may be used interchangeably with the 2-inch No. 1583 Boyle flange.

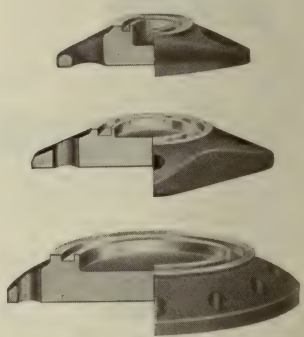


**BLIND FLANGES**  
**FOR AMMONIA**  
**MALLEABLE IRON**

**TONGUE**



**GROOVE**



**No. 1555 TONGUE**

**No. 1557 GROOVE**

Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
No. 1555, without Bolts or Gasket.....Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1555, with Bolts and Gasket.....Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00
No. 1557, without Bolts or Gasket.....Each	.40	.45	.50	.65	.95	1.00	1.20	1.40	2.50
No. 1557, with Bolts and Gasket.....Each	.50	.55	.70	.90	1.20	1.25	1.50	1.70	3.00

Style of Flanges.....	ROUND								
Size.....Inches	3	3 1/2	4	5	6	7	8	10	12
No. 1555, without Bolts or Gasket.....Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1555, with Bolts and Gasket.....Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50
No. 1557, without Bolts or Gasket.....Each	3.00	3.50	4.25	5.25	6.25	7.50	9.00	12.50	18.50
No. 1557, with Bolts and Gasket.....Each	3.75	4.25	5.00	5.75	7.50	8.50	11.00	15.50	21.50

For dimensions, see page 731.

Templates for drilling, page 731.

# RETURN BENDS

FOR AMMONIA

FERROSTEEL

TONGUE AND GROOVE ENDS



No. 1559



No. 1561

Size.....Inches	1¼	1½	* 2	2	2	2	2
Center to Center .....Inches	4	6	4⅝	6	8	10	12
No. 1559, Plain, without Flanges, Bolts and Gaskets.....Each	1.90	2.40	2.60	2.85	3.40	4.25	5.10
No. 1559, Plain, with Flanges, Bolts and Gaskets.....Each	3.40	3.90	4.60	4.85	5.40	6.25	7.10
No. 1561, with Back Outlet, with- out Flanges, Bolts and Gas- kets.....Each	2.30	2.90	3.10	3.40			
No. 1561, with Back Outlet, with Flanges, Bolts and Gaskets, Each	4.15	4.75	5.45	5.75			
Size of Back Outlet.....Inches	½	½	½	½			

\*On tongue and groove end return bends, with 4⅝ inch centers, it is necessary to use special square flanges, prices for which are given on page 503. Standard flanges are used on all other sizes.

Unless otherwise specified we will always furnish Fittings complete with Companion Flanges, Gaskets and Bolts.

For dimensions, see page 730.

# RETURN BENDS

FOR AMMONIA

MALLEABLE IRON

SCREW ENDS WITH SOLDERING RECESS



No. 1562



No. 1564

Size.....Inches	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼
Center to Center, Inches	1¾	2½	3	2¼	2½	3	3½	4	6
No. 1562, Plain..Each	.60	.75	.85	.90	.95	1.00	1.15	1.20	1.55
No. 1564, with ½ inch Back Outlet...Each									1.90

Size.....Inches	1½	1½	1½	2	2	2	2	2	2
Center to Center, Inches	3	6	8	3	3½	4	4⅝	6	8
No. 1562, Plain..Each	1.15	1.75	2.00	1.25	1.30	1.90	2.25	3.25	3.50
No. 1564, with ½ inch Back Outlet...Each					2.15	2.25			

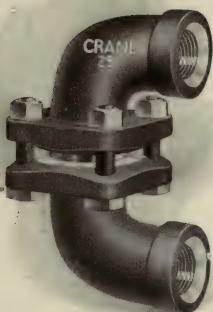
An extra price is charged for tapping right and left.  
For dimensions, see page 729.

# DIVIDED RETURN BENDS

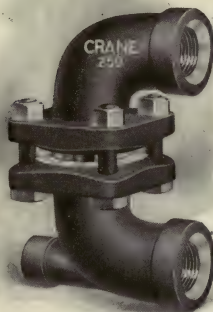
FOR AMMONIA

MALLEABLE IRON

SCREW ENDS WITH SOLDERING RECESS



No. 1570

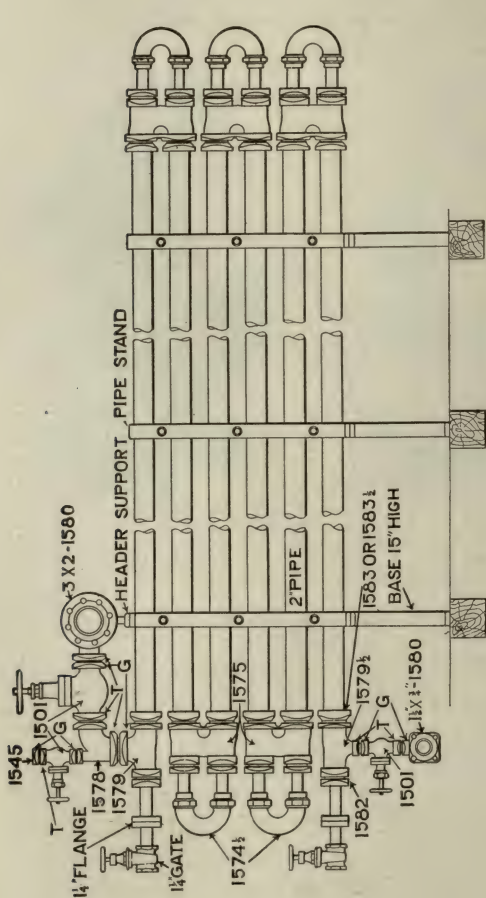


No. 1572

Size.....Inches	1¼	1¼	2	2	2	2
Center to Center.....Inches	4	6	3½	4	4⅝	6
No. 1570, Plain.....Each	2.50	2.70	4.40	4.75	5.00	6.00
No. 1572, with Back Outlet.....Each		3.15	4.85	5.20	5.45	
Size of Back Outlet.....Inches		½		½		

For dimensions, see page 730.

# APPLICATION OF DOUBLE PIPE AMMONIA CONDENSER FITTINGS

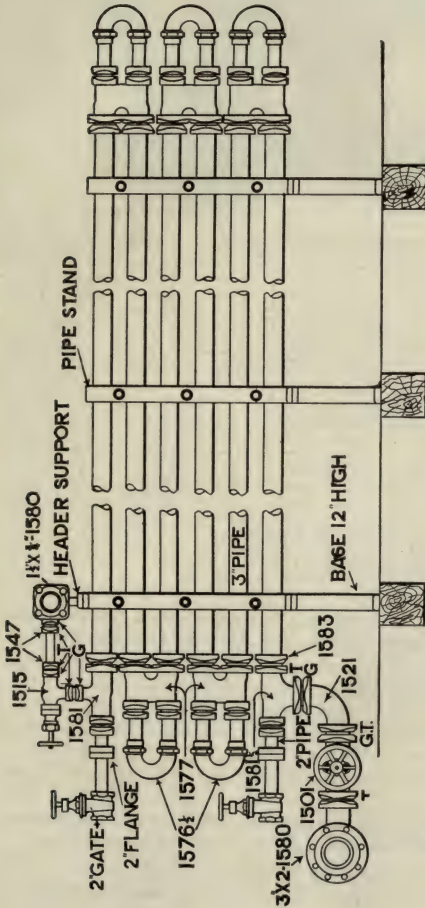


Letters T or G indicate Tongue or Groove

- |                          |                                    |
|--------------------------|------------------------------------|
| 1501—Globe Valves        | 1583—Special Square Boyle Flange   |
| 1545—Companion Flange    | 1583½—Special Square Groove Flange |
| 1574½—Union Water Bend   |                                    |
| 1575—Ammonia Return Bend |                                    |
| 1578—Back Outlet Elbow   |                                    |
|                          | 1579—Inlet Tee                     |
|                          | 1579½—Outlet Tee                   |
|                          | 1580—Header Tees                   |
|                          | 1582—Special Oval Gland            |



# APPLICATION OF DOUBLE PIPE BRINE COOLER FITTINGS



Letters T or G indicate Tongue or Groove

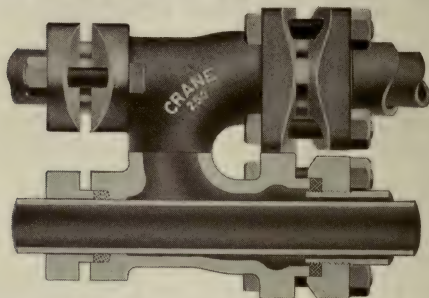
1501—Globe Valve  
1515—Expansion Valve  
1521—Elbow  
1547—Companion Flange

1576½—Union Brine Bend  
1577—Ammonia Return Bend  
1580—Header Tee

1581—Inlet Tee  
1581½—Outlet Tee  
1583—Special Square Boyle Flange

# DOUBLE PIPE RETURN BENDS

FOR CONDENSERS AND BRINE COOLERS



Size.....Inches	2 x 1 1/4	2 1/2 x 1 1/4	2 1/2 x 2 x 1 1/4	3 x 2
Center to Center.....Inches	4 5/8	4 5/8	4 5/8	6
No. 1575, Ammonia Return Bends, without Companion Flanges, Glands, Bolts and Gaskets.....Each	4.55	5.25	5.25	
No. 1575, Ammonia Return Bends, with Two Special Companion Boyle Flanges, Two Special Oval Companion Glands, Bolts and Gaskets.....Each	8.00	10.35	10.35	
No. 1577, Ammonia Return Bends, without Companion Flanges, Glands, Bolts and Gaskets.....Each				7.50
No. 1577, Ammonia Return Bends, with Two Special Companion Boyle Flanges, Two Special Oval Companion Glands, Bolts and Gaskets.....Each				14.00

Unless otherwise specified, we will always furnish Bends complete with Companion Flanges, Glands, Gaskets and Bolts.

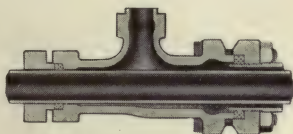
Crane Double Pipe Return Bends are so constructed that a particular water or ammonia bend may be removed, thus permitting a section of pipe being taken out of any part of a condenser or brine cooler without tearing down the entire stand.

This construction also makes it possible to easily detect leaky joints.

Double Pipe Bends for condensers and brine coolers are identical in design, the only difference being in the size.

For dimensions, see page 727.

For Double Pipe Water Cooler Fittings, see page 516.

**SPECIAL REDUCING TEES****FERROSTEEL****FOR DOUBLE PIPE BRINE COOLERS****No. 1579****No. 1579 1/2****INLET TEES**

Size.....Inches	2 x 1 1/4 x 1/2	2 x 1 1/4 x 1	2 x 1 1/4 x 1 1/4	2 x 1 1/4 x 1 1/2
No. 1579, without Companion Flange and Gland, Bolts and Gaskets.....Each	4.00	4.25	4.25	4.25
No. 1579, with Special 2 inch Square Groove or Boyle Companion Flange and Special 1 1/4 inch Oval Companion Gland, and Bolts and Gaskets for same.....Each	6.45	6.70	6.70	6.70

Size.....Inches	2 x 1 1/4 x 2	2 1/2 x 1 1/4 x 2	
No. 1579, without Companion Flange and Gland, Bolts and Gaskets.....Each	4.25	4.75	
No. 1579, with Special 2 1/2 inch Rectangular or Boyle Companion Flange and Special 1 1/4 inch Oval Companion Gland, and Bolts and Gaskets for same, Each	6.70	8.30	

**OUTLET TEES**

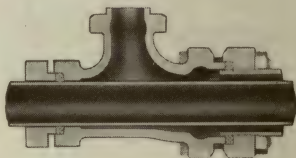
Size.....Inches	2 x 1 1/4 x 3/8	2 x 1 1/4 x 1/2	2 x 1 1/4 x 3/4
No. 1579 1/2, without Companion Flange and Gland, Bolts and Gasket.....Each	4.00	4.00	4.00
No. 1579 1/2, with Special 2 inch Square Groove or Boyle Companion Flange and Special 1 1/4 inch Oval Companion Gland and Bolts, and Gaskets for same....Each	6.45	6.45	6.45

Size.....Inches	2 x 1 1/4 x 1	2 x 1 1/4 x 1 1/4	2 x 1 1/4 x 2
No. 1579 1/2, without Companion Flange and Gland, Bolts and Gaskets.....Each	4.25	4.25	4.25
No. 1579 1/2, with Special 2 inch Square Groove or Boyle Companion Flange and Special 1 1/4 inch Oval Companion Gland and Bolts, and Gaskets for same....Each	6.70	6.70	6.70

Unless otherwise specified we will always furnish Tees complete with Companion Flanges, Gaskets and Bolts.

For Inlet and Outlet Water Cooler Tees, see page 516.

For Special Companion Flanges and Glands, see page 503.

**SPECIAL REDUCING TEES****FERROSTEEL****FOR DOUBLE PIPE AMMONIA CONDENSERS****No. 1581****No. 1581½****INLET TEES**

Size.....Inches	3 x 2 x 1½	3 x 2 x ¾	3 x 2 x 2
No. 1581, without Companion Flange, Gland, Bolts and Gaskets.....Each	9.00	9.00	9.50
No. 1581, with Special 3 inch Special Square Companion Boyle Flange, Special 2 inch Oval Companion Gland, and Bolts and Gaskets for same.....Each	13.50	13.50	14.00

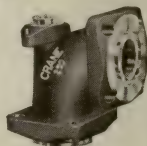
**OUTLET TEES**

Size.....Inches	3 x 2 x 1¼	3 x 2 x 1½	3 x 2 x 2
No. 1581½, without Companion Flange, Gland, Bolts and Gaskets.....Each	9.50	9.50	9.50
No. 1581½, with Special 3 inch Square Boyle Companion Flange, Special 2 inch Oval Companion Gland, and Bolts and Gaskets for same.....Each	14.00	14.00	14.00

Unless otherwise specified we will always furnish Tees complete with Companion Flanges, Gaskets and Bolts.

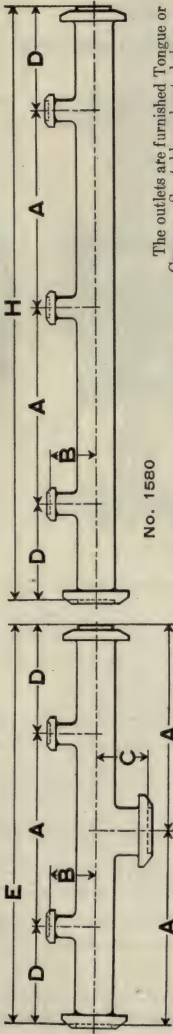
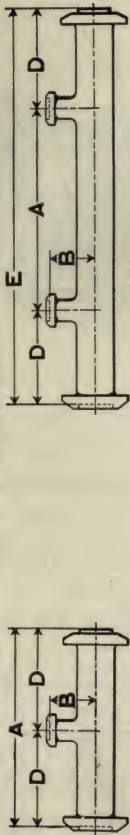
**BACK OUTLET ELBOWS****FOR AMMONIA CONDENSERS**

Size.....Inches	1½	2
No. 1578, with Back Outlet, without Flanges, Bolts and Gaskets.....Each	5.25	5.50
Size of Back Outlet.....Inches	½	½



For Special Companion Flanges and Glands, see page 503.

# HEADER TEES FOR AMMONIA CONDENSERS FERROSTEEL



No. 1580

The outlets are furnished Tongue or Groove. See table and note below.

## LIST PRICES AND DIMENSIONS

SIZE	ONE BRANCH A—Inches						TWO BRANCH A—Inches				TWO BRANCH—BACK OUTLET A—Inches				THREE BRANCH A—Inches			B BRANCH OUTLET		C BACK OUTLET	
	15	18	20	24	30		15	18	20	24	30	15	18	20	15	18	20	3 3/4"	Groove	4 7/8"	Tongue
Run Branch	4.75	5.50	6.00	6.60	8.00		8.50	9.00	10.00	11.00		9.50	11.00	12.00	13.00			4 1/4"	Groove	4 7/8"	Tongue
1 1/2 x 3/4	5.25	5.75	6.15	6.80	8.50		9.00	9.50	10.50	11.50		11.50	12.50	14.00	15.50			6 1/8"	Tongue	6 7/8"	Groove
2 x 3/4	10.00	11.50	12.25	12.50	14.00		16.25	17.50	21.00	24.00	30.50	20.00	22.50	25.00	33.00	46.00		7 1/8"	Tongue	7 3/4"	Groove
3 x 2	14.50	15.00	16.00	19.50	22.00	23.00	24.50	26.00	27.75	37.00		37.00	39.00	41.00	47.00	51.00	30.00	41.50	47.00	47.00	Groove
4 x 2																					

UNLESS OTHERWISE SPECIFIED, HEADER TEES WILL ALWAYS BE FURNISHED TONGUE AND GROOVE, VIZ.:

The run in all cases will be Tongue and Groove, and the Branch Outlet B and Back Outlet C, as indicated in the above table.

Dimension D is one-half dimension A

Dimension E is twice dimension A

Dimension H is three times dimension A



# BOYLE UNIONS

FOR AMMONIA



No. 1585 FERROSTEEL

Style of Flanges.....	OVAL				SQUARE		
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1585.....Each	1.05	1.15	1.35	1.60	1.95	2.65	3.10

Style of Flanges.....	SQUARE		ROUND				
Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1585.....Each	3.70	6.25	9.50	11.50	13.65	18.00	22.00

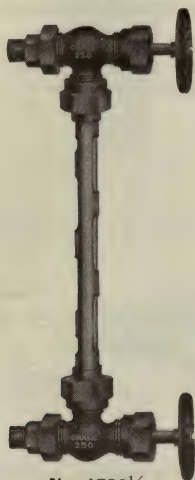
For dimensions, see page 731.

For extra ferrules, see page 517.

# SAFETY AMMONIA GAUGES

## WITH

# AUTOMATIC GAUGE VALVES

No. 1586 $\frac{1}{2}$ 

The construction of these Gauge Valves is such, should the glass tube be broken, the valves instantly and automatically close, allowing the installation of a new tube and preventing loss or danger from escaping ammonia.

### PRICE, COMPLETE INCLUDING GLASS TUBE AND GUARD 15 INCH CENTER

$\frac{1}{2}$ inch size.....	12.50
$\frac{3}{4}$ inch size.....	15.00

Over 15 inch center add 25 cents per inch.

### EXTRA PARTS FOR GAUGES WITH 15 INCH CENTERS

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$
Guard.....Each	4.50	4.50
Glass.....Each	.20	.25
Valve.....Each	5.00	6.50

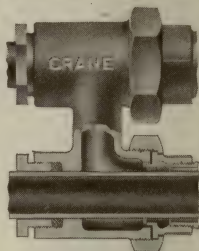
The glass and guards in these gauges are  $\frac{5}{8}$  inch.

# DOUBLE PIPE WATER COOLER FITTINGS

## DOUBLE PIPE WATER COOLER RETURN BEND

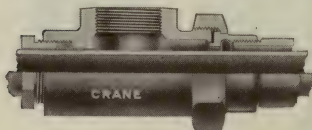
PRICE,  
COMPLETE AS SHOWN

Size.....	Inches	2 x 1 $\frac{1}{4}$ x 4 $\frac{5}{8}$
Price, Black.....	Each	4.75
Price, Galvanized.....	Each	6.50

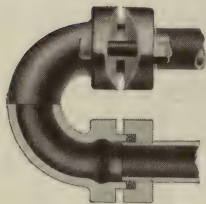
No. 1575 $\frac{1}{2}$ 

## INLET AND OUTLET WATER COOLER TEE

PRICE,  
COMPLETE AS SHOWN

No. 1575 $\frac{3}{4}$ 

Size.....	Inches	2 x 1 $\frac{1}{4}$ x 2
Price, Black.....	Each	4.50
Price, Galvanized....	Each	6.25



No. 1574

## RETURN BENDS

FOR  
CONDENSERS,  
BRINE COOLERS  
AND  
WATER COOLERS

No. 1574 $\frac{1}{2}$ 

Size.....	Inches	1 $\frac{1}{4}$	2
Center to Center.....	Inches	4 $\frac{5}{8}$	6
No. 1574, Water Return Bends, without Companion Flanges, Bolts and Gaskets.....	Each	1.75	
No. 1574, Water Return Bends, with Special 1 $\frac{1}{4}$ inch Oval Companion Flanges, Bolts and Gaskets.....	Each	3.25	
No. 1574 $\frac{1}{2}$ , Water Return Bends.....	Each	1.60	
No. 1576 $\frac{1}{2}$ , Brine Return Bends.....	Each		3.00
No. 1576, Brine Return Bends, without Companion Flanges, Bolts and Gaskets.....	Each		2.45
No. 1576, Brine Return Bends, with Special 2 inch Oval Companion Flanges, Bolts and Gaskets.....	Each		4.45

Nos. 1574 and 1576 Bends have both ends tongue.

Unless otherwise specified we will always furnish No. 1574 and No. 1576 Bends complete with Companion Flanges, Gaskets and Bolts.

**FERRULES FOR AMMONIA FITTINGS****FERROSTEEL**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 1586.....Each	.25	.25	.30	.30	.30	.30	.35	.35

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8
No. 1586.....Each	.45	.45	.95	.95	1.40	1.50	2.00	2.50

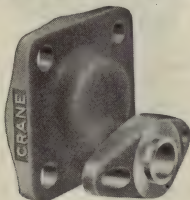
These Ferrules are used when bolting two groove flanges together.

**DOUBLE GROOVE FERRULES****FERROSTEEL**

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 1586 $\frac{1}{4}$ .....Each	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50

Size.....Inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8
No. 1586 $\frac{1}{4}$ .....Each	2.25	2.25	2.40	3.35	3.55	3.65	5.00	5.20

These Ferrules are used when bolting two tongue flanges together.

**SPECIAL ECCENTRIC REDUCERS****FERROSTEEL****FOR ATMOSPHERIC AMMONIA CONDENSERS****No. 1573 $\frac{1}{2}$** 

Size.....Inches	2 x $\frac{3}{4}$
No. 1573 $\frac{1}{2}$ , without Companion Flanges, Bolts and Gaskets.....Each	4.00

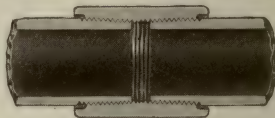
# WROUGHT COUPLINGS

FOR AMMONIA

PLAIN AND RECESSED



No. 1588 PLAIN



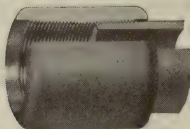
No. 1590 RECESSED

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 1588, Plain.....Each	.14	.14	.20	.26	.34	.42
No. 1590, Recessed.....Each	.25	.25	.30	.35	.45	.55

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 1588, Plain.....Each	.56	.80	1.20	1.60	2.00		
No. 1590, Recessed.....Each	.70	.95	1.40	1.85	2.25	4.80	5.60

# XX HYDRAULIC COUPLINGS

FOR AMMONIA

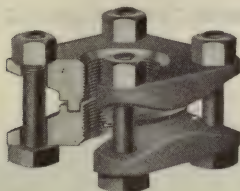


Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Outside Diameter.....Inches	1.66	1.90	2.22	2.44	3.19	3.62
Length.....Inches	1.88	2.63	2.88	3.13	3.38	3.63
Threads to Inch of Screw.....	14	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	8
Weight, Each.....Pounds	.70	1.12	1.50	1.88	3.55	4.50
No. 1588 $\frac{1}{2}$ , Plain.....Each	.40	.55	.70	.85	1.15	1.60
No. 1590 $\frac{1}{2}$ , Recessed, Plain.....Each	.50	.65	.85	1.00	1.30	1.85



# COMPANION FLANGE UNIONS

FOR AMMONIA



No. 1589 MALLEABLE

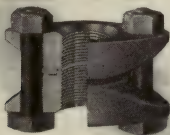
Style of Flanges.....	OVAL				SQUARE				
Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 1589.....Each	.90	1.00	1.20	1.55	2.15	2.25	2.70	3.10	5.50

Style of Flanges....	ROUND								
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
No 1589 .....Each	6.75	7.75	9.25	11.00	13.75	16.00	20.00	28.00	40.00

These unions consist of standard tongue and groove flanges bolted together, with "Cranite" gasket.

## SPECIAL OVAL FLANGE UNIONS

FOR AMMONIA



No. 1591 $\frac{1}{2}$  MALLEABLE

Size.....Inches	1	$1\frac{1}{4}$
Price.....Each	1.50	1.75

## AMMONIA GAUGES



No. 1587

Size Dial.....Inches	8½	6¾	6
No. 1587, Iron Case, N. P. Ring.....Each	45.75	40.60	35.50

Size Dial.....Inches	5½	5	4½
No. 1587, Iron Case, N. P. Ring.....Each	30.50	30.50	25.50

No cocks are furnished with these gauges.

These gauges are carried in stock in the following graduations:

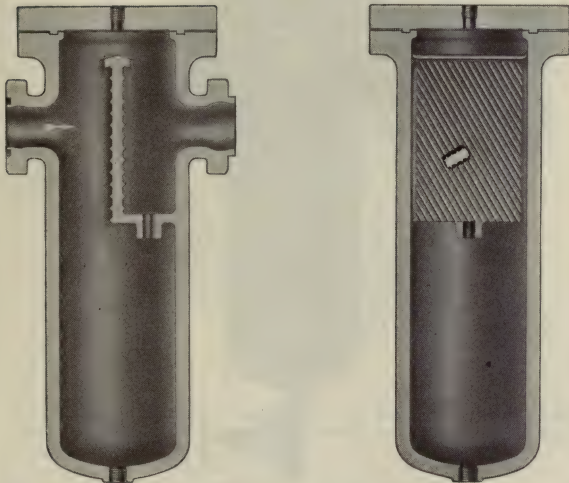
Low Pressure—150 pounds pressure, 30 inches vacuum.  
High Pressure—300 pounds pressure, 30 inches vacuum.

## OIL SEPARATORS

FOR AMMONIA

PATENTED

FERROSTEEL



Careful consideration has been given this improved design of Crane Oil Separators for Ammonia, as shown above and on following page.

They have been planned with the view of obtaining a large baffle surface and such internal area that the velocity of flow will be diminished, rather than increased, when passing through the machine.

Another feature of Crane Separators is, the provision of means for examining and cleaning the interior. This is an extremely important point.

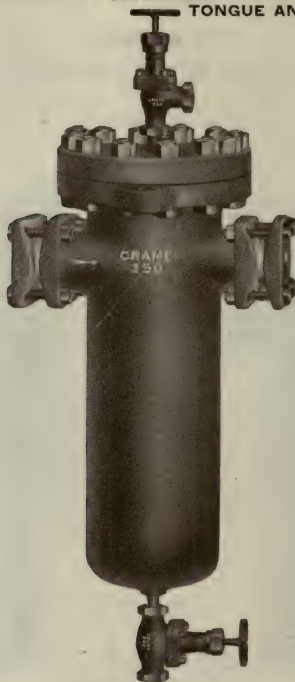
# OIL SEPARATORS

## FOR AMMONIA

PATENTED

FERROSTEEL

TONGUE AND GROOVE ENDS

No. 1594 $\frac{1}{2}$ 

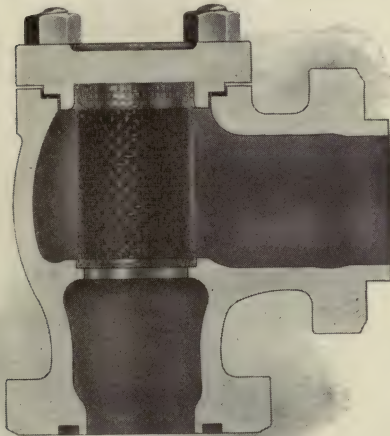
Style of Flanges.....	OVAL	SQUARE				
Size.....Inches	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$
With Companion Flanges, Bolts and Gaskets, Drain and Purge Valves.... Each	45.00	65.00	65.00	100.00	100.00	100.00
With Companion Flanges, Bolts and Gaskets, but without Drain and Purge Valves..... Each	34.00	54.00	54.00	88.50	88.50	88.50

Style of Flanges.....	ROUND				
Size.....Inches	3	3 $\frac{1}{2}$	4	5	6
With Companion Flanges, Bolts and Gaskets, Drain and Purge Valves.... Each	140.00	140.00	140.00	260.00	260.00
With Companion Flanges, Bolts and Gaskets, but without Drain and Purge Valves..... Each	128.00	128.00	128.00	247.00	247.00

Sizes above 6 inch, made to order at a special price. For dimensions, see page 721.

**SEDIMENT TRAPS  
FOR AMMONIA  
FERROSTEEL  
TONGUE AND GROOVE ENDS**



**No. 1595**

**WITHOUT COMPANION FLANGES, BOLTS OR GASKETS**

Style of Flanges	SQUARE					ROUND				
Size. . . . . Inches	1	1¼	1½	2	2½	3	3½	4	5	6
Price. . . . . Each	10.00	14.00	16.25	20.00	25.00	42.00	54.00	68.00	106.00	140.00

**WITH COMPANION FLANGES, BOLTS AND GASKETS**

Style of Flanges	SQUARE					ROUND				
Size. . . . . Inches	1	1¼	1½	2	2½	3	3½	4	5	6
Price. . . . . Each	11.85	16.75	19.00	23.70	30.50	51.30	65.40	81.30	122.65	162.15

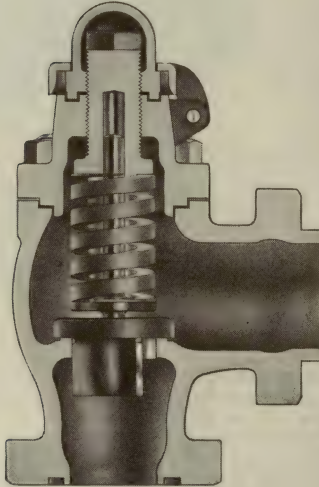
Smaller and larger sizes made to order. Prices on application.

Unless otherwise specified we will always furnish Traps complete with Companion Flanges, Gaskets and Bolts.

Sediment Traps have the same dimensions as Tongue and Groove Angle Valves and Elbows.

The Steel Wire Screen may be readily taken out and cleaned.



**RELIEF VALVES****FOR AMMONIA****FERROSTEEL****TONGUE AND GROOVE ENDS****No. 1596**

Crane Ammonia Relief Valves have received the official sanction of the City of Chicago, where relief valves are required in all ammonia plants.

These valves may be set to blow off at any point up to 250 pounds.

The cap may be sealed or locked to prevent the changing of the set pressure by unauthorized persons.

**RELIEF VALVES****FOR AMMONIA****FERROSTEEL****TONGUE AND GROOVE ENDS****No. 1596**

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
No. 1596, without Companion Flanges, Bolts and Gaskets .....								
..... Each	15.50	16.50	18.30	20.25	24.75	33.00	49.80	60.00
No. 1596, with Companion Flanges, Bolts and Gaskets. . Each	16.45	17.70	19.80	22.50	27.00	36.00	54.00	67.50
No. 1596, Screw Ends..... Each	15.50	16.50						

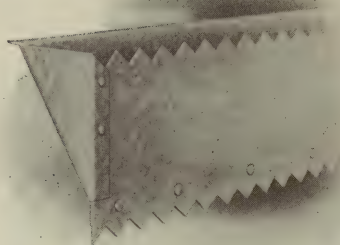
Relief Valves can also be furnished Globe pattern at same price as Angle.

Unless otherwise specified we will always furnish Valves complete with Companion Flanges, Gaskets and Bolts.

Relief Valves take standard ammonia flanges.

## GALVANIZED WATER TROUGHS

FOR ATMOSPHERIC AMMONIA CONDENSERS



Water Troughs of any size and style will be made to order.

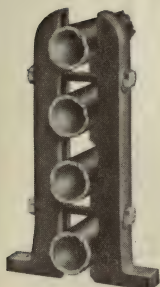
We recommend these troughs as superior to ordinary troughs in design, material and workmanship. They will be supplied at the following prices:

Gauge	Price, per Foot
20	1.00
18	1.10
16	1.25
12	1.75

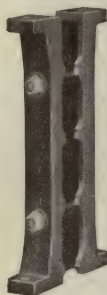
# PIPE STANDS

CAST IRON

FOR AMMONIA CONDENSERS AND BRINE COOLERS



TOP SECTION



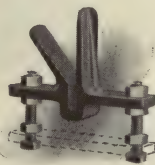
INTERMEDIATE  
SECTION



HEADER SUPPORT



BASE



TROUGH SUPPORT

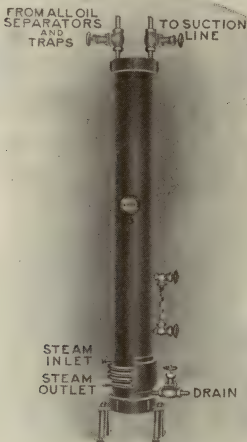
Size of Pipe.....Inches		2			*2 & 2½	2½	3
Centers.....Inches		3½	4	4⅝	4⅝	4⅝	6
INTERMEDIATE SECTION. Each.	Number pipes high. 2						
	3			2.25			
	4	2.40	2.50	2.50	3.00	3.00	3.25
	5		3.30				
	6	3.50	3.75	3.75			5.00
	7		5.00				
	8	5.00					
TOP SECTION. Each.	Number pipes high. 2						
	3			2.25			
	4		2.50	2.50	3.00	3.00	3.25
	5			3.50			
	6			3.75		4.70	5.00
Base, 9 inches high.....Each		2.50					
Base, 12 inches high.....Each							3.25
Base, 15 inches high.....Each		3.00					
Header Support.....Each		2.00					2.50
Trough Support.....Each		1.00					

\*For two 2 inch and two 2½ inch pipes.

The 9 and 15 inch Bases are used on both atmospheric and double pipe condensers; the 12 inch base on brine coolers.

A complete stand consists of a base, intermediate sections and a top section, but an intermediate section may be used at the top if desired.

## SPECIAL OIL SEPARATORS FOR AMMONIA PLANTS



This separator will positively remove all oil and other foreign matter from the ammonia and return it to the system without loss.

### APPLICATION

The installation of one of these separators will greatly increase the efficiency of any refrigerating ice machine, and effect a saving in its operation.

### OPERATION

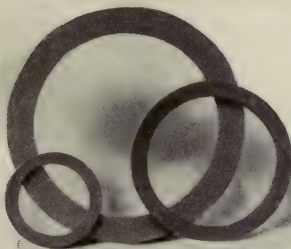
Allow oil and other substances to drain to the separator until oil shows in the gauge glass, then shut off the supply valve from all traps and separators, but allow valve to suction line to remain open—turn steam into the coil at the base of separator and keep in for about twenty-four hours—then close valve to the suction line and drain separator through the drain valve.

**CORRESPONDENCE REGARDING THE INSTALLATION OR  
OPERATION OF THESE SEPARATORS IS SOLICITED**



## GASKETS

FOR TONGUE AND GROOVE JOINTS



Size of Valve or Fitting.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Outside Diameter of Gasket....Inches	$\frac{31}{32}$	$1\frac{3}{32}$	$1\frac{7}{32}$	$1\frac{11}{32}$	$1\frac{15}{32}$	$2\frac{7}{32}$	$2\frac{11}{32}$	$3\frac{3}{32}$	$3\frac{31}{32}$
Inside Diameter of Gasket.....Inches	$\frac{19}{32}$	$\frac{23}{32}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{7}{16}$	$2\frac{15}{16}$
Cranite.....Per Dozen	.25	.30	.30	.40	.40	.50	.50	.55	.60
Rubber.....Per Dozen	.25	.30	.30	.40	.40	.50	.50	.55	.60
Lead.....Per Dozen	.45	.50	.50	.70	.90	1.25	1.25	1.50	1.70

Size of Valve or Fitting.....Inches	3	$3\frac{1}{2}$	4	5	6	7	8	10	12
Outside Diameter of Gasket....Inches	$4\frac{9}{32}$	$4\frac{27}{32}$	$5\frac{15}{32}$	$6\frac{27}{32}$	$7\frac{11}{32}$	$9\frac{5}{8}$	$10\frac{7}{8}$	$13\frac{1}{8}$	$15\frac{1}{8}$
Inside Diameter of Gasket.....Inches	$3\frac{9}{16}$	$4\frac{1}{16}$	$4\frac{9}{16}$	$5\frac{5}{8}$	$6\frac{11}{16}$	$8\frac{5}{8}$	$9\frac{5}{8}$	$11\frac{5}{8}$	$13\frac{5}{8}$
Cranite.....Per Dozen	.70	.85	1.00	1.20	1.50	1.80	2.40	3.00	3.75
Rubber.....Per Dozen	.70	.85	1.00	1.20	1.50	1.80	2.40	3.00	3.75
Lead.....Per Dozen	1.85	2.15	2.40	2.70	3.50	4.20	4.80	5.60	6.50

When ammonia valves and fittings with tongue and groove ends are ordered complete with flanges, bolts and gaskets, "Cranite" gaskets will always be furnished, unless lead or rubber is specified.

# RUBBER GASKETS

FOR SCREW-GLAND AND BOYLE JOINTS



Size of Valve or Fitting....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Outside Diameter of Gasket,Inches	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Inside Diameter of Gasket, Inches	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{1}{2}$	$1\frac{11}{16}$	$1\frac{15}{16}$
Thickness of Gasket.....Inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$
Canvas-wrapped or Plain,Per Doz.	1.40	1.60	1.85	2.10	2.60	5.00	5.30

Size of Valve or Fitting....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Outside Diameter of Gasket,Inches	$3\frac{1}{8}$	$3\frac{11}{16}$	$4\frac{5}{16}$	$4\frac{7}{8}$	$5\frac{1}{2}$	$6\frac{7}{8}$	$7\frac{7}{8}$
Inside Diameter of Gasket, Inches	$2\frac{7}{16}$	$2\frac{23}{32}$	$3\frac{9}{16}$	$4\frac{1}{8}$	$4\frac{9}{16}$	$5\frac{5}{8}$	$6\frac{11}{16}$
Thickness of Gasket.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$
Canvas-wrapped or Plain,Per Doz.	8.10	13.20	16.80	21.00	26.00	49.00	60.00

## CRANITE

CRANITE is the packing used by CRANE CO. for severe service, such as superheated steam, dry air, acids, oils, ammonia, alkali, hot sugar solutions, gases, etc.

CRANITE gaskets are used on all CRANE valves for high pressure, saturated or superheated steam.

CRANITE is particularly recommended for use on gasoline engines.

CRANITE is an asbestos packing, and only selected long fiber is used in its manufacture, giving it added strength.

It covers more surface per pound than any other packing.

It can be used over and over again by applying graphite to its surfaces.

It will not press, burn, or blow out of joints.

It does not stick to surfaces.

It saves labor, a joint once made requires no after tightening up.

Regularly, the packing comes in sheets  $\frac{1}{16}$  inch thick, size 36 x 36 inches.

If sufficient time is allowed this packing will be made to order in any thickness from  $\frac{3}{32}$  to  $\frac{1}{8}$  inch.

As CRANITE does not deteriorate with age, it will be found economical to purchase it in quantities.

### PRICES IN SHEETS

$\frac{1}{16}$ inch and thicker.....	\$1.00 net per lb.
Less than $\frac{1}{16}$ inch.....	1.25 net per lb.

The  $\frac{1}{16}$  inch sheets weigh a little over a half pound to the square foot.

FOR PRICES AND DIMENSION TABLES OF CRANITE GASKETS, SEE PRICE LISTS OF GASKETS, VIZ.:

FOR STANDARD AND LOW PRESSURE FLANGED VALVES AND FITTINGS, PAGES 532 AND 533.

FOR EXTRA HEAVY AND MEDIUM FLANGED VALVES AND FITTINGS, PAGES 534 AND 535.



## GASKETS

FOR STANDARD AND LOW PRESSURE  
FLANGED VALVES AND FITTINGS



RUBBER  
RING GASKET

NET PRICES AND DIMENSIONS

CORRUGATED COPPER  
FULL FACE GASKET

## RING GASKETS

## FULL FACE GASKETS

Size of Valve or Fitting Inches	RING GASKETS		FULL FACE GASKETS			
	$\frac{1}{16}$ Inch Cloth Insertion Gaskets Each	$\frac{1}{16}$ Inch "CC" Gaskets Each	Corru- gated Copper Gaskets Each	$\frac{1}{16}$ Inch "CC" Gaskets Each	Corru- gated Copper Gaskets Each	$\frac{1}{16}$ Inch Granite Gaskets Each
$\frac{3}{4}$	.02	.04	.04	.08	.10	Inside and Outside Diameters Inches $\frac{3}{4} \times 3\frac{1}{2}$
1	.02	.04	.04	.08	.10	$1 \times 4$
$1\frac{1}{4}$	.03	.06	.06	.12	.12	$1\frac{1}{4} \times 4\frac{1}{2}$
$1\frac{1}{2}$	.03	.06	.08	.12	.14	$1\frac{1}{2} \times 5$
2	.03	.08	.10	.16	.20	$2 \times 6$
$2\frac{1}{2}$	.04	.10	.12	.20	.26	$2\frac{1}{2} \times 7$
3	.05	.12	.14	.24	.28	$3 \times 7\frac{1}{2}$
$3\frac{1}{2}$	.06	.16	.18	.32	.36	$3\frac{1}{2} \times 8\frac{1}{2}$
4	.07	.18	.20	.35	.38	$4 \times 9$
$4\frac{1}{2}$	.07	.20	.22	.40	.40	$4\frac{1}{2} \times 9\frac{1}{4}$
5	.08	.24	.24	.48	.46	$5 \times 10$
6	.10	.28	.26	.56	.52	$6 \times 11$
7	.12	.32	.30	.64	.64	$7 \times 12\frac{1}{2}$
8	.13	.35	.34	.70	.72	$8 \times 13\frac{1}{2}$
9	.16	.40	.46	.80	.92	$9 \times 15$
10	.18	.48	.50	.95	1.00	$10 \times 16$

CONTINUED ON NEXT PAGE

## CONTINUED FROM OPPOSITE PAGE

12	.25	.60	.72	1.00	12×16½	.50	1.20	1.75	2.00	12×19
14	.30	.75	.76	1.25	14×17¾	.55	1.35	2.00	2.25	14×21
15	.32	.85	1.10	1.50	15×19	.65	1.55	2.20	2.75	15×22¼
16	.35	.95	1.25	1.75	16×20¼	.70	1.70	2.40	3.25	16×23½
18	.37	1.10	1.35	1.90	18×21½	.80	1.90	2.60	3.50	18×25
20	.44	1.20	1.50	2.10	20×23½	.85	2.10	2.90	3.75	20×27½
22	.48	1.25	1.65	2.50	22×26	.90	2.20	3.25	4.50	22×29½
24	.60	1.40	1.90	2.80	24×28¼	1.10	2.50		5.00	24×32
26	.70	1.50		3.50	26×30½	1.40	3.50		7.00	26×34¼
28	.80	2.00		4.00	28×32¾	1.50	3.75		8.00	28×36½
30	.90	2.10		4.00	30×34½	1.65	4.25		8.00	30×38¾
32	1.00	2.75			32×37	1.80	5.50			32×41¾
34	1.15	3.00			34×39	2.00	6.00			34×43¾
36	1.25	3.25			36×41¼	2.20	6.50			36×46
38	1.35	3.50			38×43½		7.00			38×48¾
40	1.45	3.75			40×45½		7.50			40×50¾
42	1.50	3.85			42×47½		7.75			42×53
44		4.00			44×50½		8.00			44×55¼
46		4.25			46×52½		8.50			46×57¼
48		4.50			48×54¾		9.00			48×59½
50		5.00			50×56½		10.00			50×61¾

Ring gaskets will always be furnished, unless otherwise ordered.

The commercial corrugated copper gasket is made from 27 gauge sheet copper, and this gauge will be furnished on all orders for low pressure or standard copper gaskets. We can furnish these gaskets made from heavier sheet copper at an extra price. We can furnish gaskets made from any sheet rubber or metal that is manufactured.

Full Face Gaskets are furnished without bolt holes; bolt holes will be punched at an extra price when so ordered.

ALL THE ABOVE PRICES ARE NET



# GASKETS

## FOR MEDIUM AND EXTRA HEAVY FLANGED VALVES AND FITTINGS

### NET PRICES AND DIMENSIONS

RING GASKETS					FULL FACE GASKETS			
Size of Valve or Fitting	"CC" Gas-kets	Corrugated Copper Gas-kets	$\frac{1}{16}$ Inch Cran-ite Gas-kets	Inside and Outside Diameters	"CC" Gas-kets	Corrugated Copper Gas-kets	$\frac{1}{16}$ Inch Cran-ite Gas-kets	Inside and Outside Diameters
Inches	Each	Each	Each	Inches	Each	Each	Each	Inches
1	.08	.08	.08	$1 \times 2\frac{3}{4}$	.18	.18	.18	$1 \times 4\frac{1}{2}$
$1\frac{1}{4}$	.08	.08	.10	$1\frac{1}{4} \times 3\frac{1}{4}$	.18	.18	.22	$1\frac{1}{4} \times 5$
$1\frac{1}{2}$	.08	.08	.12	$1\frac{1}{2} \times 3\frac{7}{8}$	.18	.18	.27	$1\frac{1}{2} \times 6$
2	.09	.10	.15	$2 \times 4\frac{3}{8}$	.21	.24	.35	$2 \times 6\frac{1}{2}$
$2\frac{1}{2}$	.12	.12	.19	$2\frac{1}{2} \times 5\frac{1}{8}$	.25	.30	.38	$2\frac{1}{2} \times 7\frac{1}{2}$
3	.15	.16	.24	$3 \times 5\frac{7}{8}$	.32	.36	.50	$3 \times 8\frac{1}{4}$
$3\frac{1}{2}$	.16	.18	.27	$3\frac{1}{2} \times 6\frac{1}{2}$	.35	.42	.60	$3\frac{1}{2} \times 9$
4	.18	.20	.33	$4 \times 7\frac{1}{8}$	.45	.50	.75	$4 \times 10$
$4\frac{1}{2}$	.21	.24	.35	$4\frac{1}{2} \times 7\frac{3}{4}$	.47	.54	.80	$4\frac{1}{2} \times 10\frac{1}{2}$
5	.25	.30	.45	$5 \times 8\frac{1}{2}$	.50	.60	.90	$5 \times 11$
6	.30	.36	.55	$6 \times 9\frac{7}{8}$	.60	.72	1.10	$6 \times 12\frac{1}{2}$
7	.40	.42	.70	$7 \times 11$	.75	.90	1.35	$7 \times 14$
8	.42	.48	.75	$8 \times 12\frac{7}{8}$	.80	1.00	1.45	$8 \times 15$
9	.48	.54	.85	$9 \times 13$	.95	1.10	1.70	$9 \times 16\frac{1}{4}$
10	.55	.66	1.00	$10 \times 14\frac{1}{4}$	1.05	1.30	1.90	$10 \times 17\frac{1}{2}$
12	.70	.84	1.25	$12 \times 16\frac{5}{8}$	1.40	2.20	2.50	$12 \times 20\frac{1}{2}$
14	1.00	1.50	1.65	$14 \times 19\frac{7}{8}$	1.70	2.75	2.75	$14 \times 23$
15	1.05	1.65	1.80	$15 \times 20\frac{1}{4}$	1.90	3.05	3.35	$15 \times 24\frac{1}{2}$
16	1.20	1.80	2.10	$16 \times 21\frac{1}{4}$	2.00	3.30	3.50	$16 \times 25\frac{1}{2}$
18	1.35	2.00	2.40	$18 \times 23\frac{1}{2}$	2.20	3.60	4.00	$18 \times 28$
20	1.45	2.35	2.75	$20 \times 25\frac{5}{8}$	2.50		4.25	$20 \times 30\frac{1}{2}$
22	1.55	2.50	3.00	$22 \times 27\frac{3}{4}$	2.80		5.50	$22 \times 33$
24	1.90		3.50	$24 \times 30\frac{3}{8}$	3.15		6.00	$24 \times 36$

Ring Gaskets cover the faces of flanges inside of bolt holes, and will always be furnished unless otherwise ordered.

Corrugated Copper Gaskets are made from 27 Gauge copper. We can, however, furnish these Gaskets made from a heavier gauge of copper, at an extra price, with either plain or corrugated faces, and hard or annealed. Special Corrugated Sheet Iron, or Steel Gaskets, for cyanide piping, made to order. We can furnish Gaskets, at special prices, made from any brand of sheet rubber or metal that is manufactured.

Full Face Gaskets are furnished without bolt holes; bolt holes will be punched at an extra price when so ordered.

Note the superior claims of "Cranite" for high pressure and super-heated steam as described on page 531.

# GASKETS

## FOR MEDIUM AND EXTRA HEAVY FLANGED VALVES AND FITTINGS

### NET PRICES AND DIMENSIONS

GASKETS FOR MALE AND FEMALE JOINTS					GASKETS FOR TONGUED AND GROOVED JOINTS			
Size of Valve or Fitting	"CC" Gas- kets	Corru- gated Copper Gas- kets	$\frac{1}{16}$ Inch Cran- ite Gas- kets	Inside and Outside Diameters	"CC" Gas- kets	Corru- gated Copper Gas- kets	$\frac{1}{16}$ Inch Cran- ite Gas- kets	Inside and Outside Diameters
Inches	Each	Each	Each	Inches	Each	Each	Each	Inches
1	.05	.04	.05	$1 \times 2\frac{5}{16}$	.03	.04	.03	$1\frac{3}{4} \times 2\frac{1}{2}$
$1\frac{1}{4}$	.05	.04	.06	$1\frac{1}{4} \times 2\frac{3}{4}$	.03	.04	.03	$2\frac{1}{8} \times 3$
$1\frac{1}{2}$	.05	.06	.07	$1\frac{1}{2} \times 3\frac{1}{8}$	.03	.06	.04	$2\frac{3}{4} \times 3\frac{5}{8}$
2	.05	.08	.08	$2 \times 3\frac{5}{8}$	.03	.06	.05	$3\frac{1}{8} \times 4\frac{1}{8}$
$2\frac{1}{2}$	.06	.08	.10	$2\frac{1}{2} \times 4\frac{1}{8}$	.04	.08	.07	$3\frac{5}{8} \times 4\frac{5}{8}$
3	.08	.10	.13	$3 \times 5$	.05	.08	.08	$4\frac{1}{4} \times 5\frac{1}{4}$
$3\frac{1}{2}$	.10	.12	.17	$3\frac{1}{2} \times 5\frac{1}{2}$	.05	.10	.09	$4\frac{3}{4} \times 5\frac{3}{4}$
4	.11	.14	.20	$4 \times 6$	.06	.10	.11	$5\frac{1}{4} \times 6\frac{1}{4}$
$4\frac{1}{2}$	.13	.16	.21	$4\frac{1}{2} \times 6\frac{1}{2}$	.06	.10	.11	$5\frac{3}{4} \times 6\frac{3}{4}$
5	.15	.16	.27	$5 \times 7\frac{1}{4}$	.06	.12	.12	$6\frac{1}{4} \times 7\frac{1}{4}$
6	.16	.20	.30	$6 \times 8\frac{3}{8}$	.07	.12	.13	$7\frac{1}{2} \times 8\frac{1}{2}$
7	.20	.24	.35	$7 \times 9\frac{3}{8}$	.08	.16	.14	$8\frac{5}{8} \times 9\frac{5}{8}$
8	.25	.30	.45	$8 \times 10\frac{5}{8}$	.11	.18	.18	$9\frac{5}{8} \times 10\frac{7}{8}$
9	.27	.36	.48	$9 \times 11\frac{5}{8}$	.12	.20	.21	$10\frac{5}{8} \times 11\frac{7}{8}$
10	.32	.42	.60	$10 \times 12\frac{3}{4}$	.15	.28	.25	$11\frac{5}{8} \times 13\frac{1}{8}$
12	.44	.54	.75	$12 \times 15\frac{1}{4}$	.18	.30	.30	$13\frac{5}{8} \times 15\frac{1}{8}$
14	.48	.60	.80	$14 \times 16\frac{1}{2}$	.20	.36	.35	$15\frac{7}{8} \times 17\frac{3}{8}$
15	.50	.66	.90	$15 \times 17\frac{1}{2}$	.22	.55	.40	$17\frac{1}{8} \times 18\frac{5}{8}$
16	.58	1.00	1.05	$16 \times 18\frac{1}{2}$	.28	.65	.50	$18\frac{3}{8} \times 20\frac{1}{8}$
18	.70	1.20	1.20	$18 \times 21$	.35	.80	.70	$20\frac{3}{8} \times 22\frac{3}{8}$
20	.80	.35	1.50	$20 \times 23$	.40	1.00	.80	$22\frac{5}{16} \times 24\frac{5}{16}$
22	1.00	1.65	2.00	$22 \times 25\frac{1}{2}$	.45	1.10	.90	$24\frac{1}{2} \times 26\frac{1}{2}$
24	1.15	1.90	2.25	$24 \times 27\frac{1}{2}$	.50	1.15	1.00	$26\frac{1}{2} \times 28\frac{1}{2}$

Corrugated Copper Gaskets are made from 27 Gauge copper. We can, however, furnish these Gaskets made from a heavier gauge of copper, at an extra price, with either plain or corrugated faces, and hard or annealed. Special Corrugated Sheet Iron, or Steel Gaskets, for cyanide piping made to order. We can furnish Gaskets, at special prices, made from any brand of sheet rubber or metal that is manufactured.

Note the superior claims of "Cranite" for high pressures and super-heated steam as described on page 531.

# GASKETS

## FOR EXTRA HEAVY HYDRAULIC FERROSTEEL FLANGED VALVES AND FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

$1\frac{1}{2}$  TO  $2\frac{1}{2}$  INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
 $4\frac{1}{2}$  TO 12 INCH, 800 LBS. HYDROSTATIC

### GASKETS FOR MALE AND FEMALE JOINTS

Size of Valve or Fitting  Inches	"CC" Gaskets  Each	Corrugated Copper Gaskets  Each	$\frac{1}{16}$ Inch Cranite Gaskets  Each	Inside and Outside Diameters  Each
$1\frac{1}{2}$	.05	.06	.07	$1\frac{1}{2} \times 3\frac{1}{8}$
2	.05	.08	.08	$2 \times 3\frac{5}{8}$
$2\frac{1}{2}$	.06	.08	.10	$2\frac{1}{2} \times 4\frac{1}{8}$
3	.08	.10	.13	$3 \times 5$
$3\frac{1}{2}$	.10	.12	.17	$3\frac{1}{2} \times 5\frac{1}{2}$
4	.11	.14	.20	$4 \times 6$
$4\frac{1}{2}$	.13	.16	.21	$4\frac{1}{2} \times 6\frac{1}{2}$
5	.15	.16	.27	$5 \times 7\frac{1}{4}$
6	.16	.20	.30	$6 \times 8\frac{3}{8}$
7	.20	.24	.35	$7 \times 9\frac{3}{8}$
8	.25	.30	.45	$8 \times 10\frac{5}{8}$
9	.27	.36	.48	$9 \times 11\frac{5}{8}$
10	.32	.42	.60	$10 \times 12\frac{3}{4}$
12	.44	.54	.75	$12 \times 15\frac{1}{4}$

Corrugated Copper Gaskets are made from 27 Gauge copper. We can, however, furnish these Gaskets made from heavier gauge copper, at an extra price.

Annealed Copper and Fibre Gaskets; prices on application.

We can furnish Gaskets, at special prices, made from any flange packing that is manufactured.

Templates for drilling, page 653. Dimensions of flange faces, page 719.

## GASKETS

### FOR EXTRA HEAVY HYDRAULIC

#### CAST STEEL FLANGED VALVES AND FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

#### GASKETS FOR MALE AND FEMALE JOINTS

Size of Valve or Fitting  Inches	Corrugated Copper Gaskets  Each	$\frac{1}{8}$ Inch Cranite Gaskets  Each	Inside and Outside Diameters  Each
1½	.04	.06	1¼×2¼
2	.06	.07	1½×2¾
2½	.08	.08	2×3 $\frac{5}{16}$
3	.08	.10	2½×3 $\frac{13}{16}$
4	.10	.13	3×5
5	.16	.21	4×6 $\frac{3}{16}$
6	.16	.27	5×7¼

Corrugated Copper Gaskets are made from 27 Gauge copper. We can, however, furnish these Gaskets made from heavier gauge copper at an extra price.

Annealed Copper and Fibre Gaskets; prices on application.

We can furnish Gaskets, at special prices, made from any flange packing that is manufactured.

Templates for drilling, page 654. Dimensions of flange faces, page 720.

## STEAM PACKING

### CLOTH INSERTION. CLOTH ON ONE OR BOTH SIDES

There is one ply of cloth to every  $\frac{1}{8}$  inch thickness. Each cloth, whether insertion or outside, to count as one ply.

		1-Ply	2-Ply	3-Ply	4-Ply
$\frac{1}{32}$ inch.....	Per pound.....	.65.....			
$\frac{1}{16}$ inch.....	Per pound.....	.60.....	.63.....	.66.....	
$\frac{3}{32}$ inch.....	Per pound.....	.55.....	.58.....	.61.....	
$\frac{1}{8}$ inch.....	Per pound.....		.55.....	.58.....	.61
$\frac{3}{16}$ inch.....	Per pound.....			.55.....	.58
$\frac{1}{4}$ inch.....	Per pound.....				.55

Three cents per pound additional will be charged for each extra ply of cloth. All Cloth Insertion Packing is one yard wide and any length desired.

### CC PACKINGS, SEE PAGE 539

#### ROUND DUCK PISTON PACKING

Per pound ..... .85

Made of Cotton Fabric and Rubber Core; from  $\frac{1}{4}$  to  $1\frac{1}{2}$  inch diameter, and in lengths of 12 feet.

#### SQUARE DUCK PISTON PACKING

Per pound ..... .85

Made of Cotton Fabric, from  $\frac{1}{4}$  to  $1\frac{1}{2}$  inch square, and lengths of 12 feet.

#### SQUARE DUCK PISTON PACKING

##### RUBBER BACK

Per pound ..... 1.00

Sizes,  $\frac{1}{4}$ " to  $1\frac{1}{2}$ " square.

#### P. P. P. PISTON PACKING.

Per pound ..... 1.00

#### CC STERLING PACKING

CC Sterling, Sectional Ring ..... Per pound 2.00

CC Sterling, Spiral ..... Per pound 1.30

#### SQUARE FLAX PACKING

Per pound ..... .85

Sizes,  $\frac{1}{4}$ " to 1".

#### PURE RUBBER VALVES

Per pound ..... 1.50

#### CLOTH INSERTION GASKETS OR RINGS

Thickness,  $\frac{1}{16}$  inch or less..... Per pound 1.25

Thickness,  $\frac{3}{32}$  inch and upward..... Per pound 1.00

In all sizes above  $\frac{3}{32}$  there is one ply of cloth to every  $\frac{1}{8}$  inch thickness.

Each cloth, whether insertion or on outside, to count as one ply.

Five cents per pound additional will be charged for each extra ply of cloth.

#### PLUMBERS' SPUN OAKUM

At market prices.

#### JUTE ROPE PACKING

Tarred and Untarred.

At market prices.

#### WASTE, LAMP WICK AND GASFITTERS' CEMENT

No. 1 Waste ..... Per pound .12

Lamp Wick ..... Per pound .30

Gasfitters' Cement..... Per pound .12

Asbestos Wick Packing, Asbestos Board and Paper, page 540.

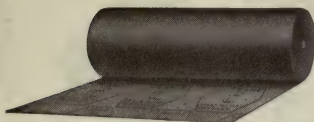
Gaskets for Standard and Low Pressure Goods, pages 532 and 533.

Gaskets for Extra Heavy Goods, pages 534 and 535.



## C. C. SHEET PACKING

MANUFACTURED SOLELY FOR CRANE CO.



Adapted for all pressures of saturated steam, hot and cold water, air, gases, etc. Made in rolls 36 inches wide, containing about 200 pounds and in any thickness from  $\frac{1}{32}$  to  $\frac{1}{2}$  inch.

PRICE PER POUND \$1.00

See pages 532 and 533, also pages 534 and 535, for prices of Gaskets for Crane Valves and Fittings. Gaskets of all sizes and shapes made to order at a special price.

## C C SHEET PACKING

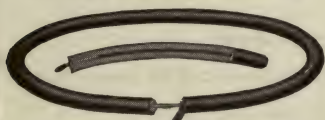
WITH WIRE INSERTION

MADE IN ROLLS 36 INCHES WIDE, ANY THICKNESS  $\frac{1}{32}$  TO  $\frac{1}{4}$  INCH

PRICE PER POUND \$1.50

## C C SECTIONAL ROPE GASKETS

FOR HAND AND MAN-HOLE PLATES



PRICE PER POUND \$1.00

Diameter Inches	Length Contained in Box Feet	Approximate Weight of Box Pounds
$\frac{3}{8}$	36	2 $\frac{3}{4}$
$\frac{1}{2}$	36	5
$\frac{5}{8}$	24	5 $\frac{3}{4}$
$\frac{3}{4}$	18	6
$\frac{7}{8}$	12	6 $\frac{1}{4}$
1	12	7

## C C SPIRAL CORE

PISTON AND VALVE ROD PACKING

SQUARE AND ROUND

PRICE PER POUND \$1.00

FURNISHED IN RINGS AT A SPECIAL PRICE



Diameter Inches	Contents of Box Feet	App. Weight of Box Pounds	Diameter Inches	Contents of Box Feet	App. Weight of Box Pounds
$\frac{1}{4}$	84	3 $\frac{1}{4}$	1	24	10
$\frac{5}{16}$	72	3 $\frac{1}{2}$	1 $\frac{1}{8}$	12	5 $\frac{1}{2}$
$\frac{3}{8}$	72	4 $\frac{1}{2}$	1 $\frac{1}{4}$	12	5 $\frac{3}{4}$
$\frac{7}{16}$	60	4 $\frac{3}{4}$	1 $\frac{3}{8}$	12	6 $\frac{1}{4}$
$\frac{1}{2}$	36	4	1 $\frac{1}{2}$	12	7 $\frac{1}{2}$
$\frac{5}{8}$	36	5 $\frac{1}{4}$	1 $\frac{5}{8}$	12	8 $\frac{1}{2}$
$\frac{3}{4}$	36	7 $\frac{1}{4}$	1 $\frac{3}{4}$	12	9
$\frac{7}{8}$	24	5 $\frac{1}{2}$	1 $\frac{7}{8}$	12	9 $\frac{3}{4}$
1	24	6	1 $\frac{1}{2}$	12	11
$\frac{1}{8}$	24	7 $\frac{1}{2}$	1 $\frac{3}{4}$	12	13 $\frac{1}{2}$
$\frac{1}{4}$	24	8 $\frac{1}{2}$	1 $\frac{1}{2}$	12	15 $\frac{1}{2}$
$\frac{1}{2}$	24	9 $\frac{1}{2}$	2	12	18 $\frac{1}{2}$

DIRECTIONS FOR USING, FURNISHED WITH PACKINGS

## ASBESTOS MATERIALS

AND

## HAIR FELT

### ASBESTOS MILL BOARD

Made in sheets 40×40 inches,  $\frac{1}{32}$  to  $\frac{1}{2}$  inch thick, weighing approximately, in pounds per sheet, as follows:

$\frac{1}{32}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
2 to 2½	3¾ to 4¼	5½ to 6	7½ to 8	11½ to 12	13½ to 14½	23 to 25	27 to 30

### ASBESTOS PAPER

Furnished in rolls 36 inches wide weighing from 80 to 100 pounds per roll.

**THIN**—about 6 pounds to 100 square feet.

**MEDIUM**—about 10 pounds to 100 square feet.

**HEAVY**—about 14 pounds to 100 square feet.

### ASBESTOS WICK PACKING

Put up in balls of  $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 pound each.

**PRICES PER POUND ON ALL THE ABOVE GOODS, ON APPLICATION**

### HAIR FELTING

Put up in rolls 6 feet wide, containing 300 square feet.

$\frac{1}{4}$  inch thick: Price per square foot 8 cents.

$\frac{1}{2}$  inch thick: Price per square foot 9½ cents.

$\frac{3}{4}$  inch thick: Price per square foot 12½ cents.

1 inch thick: Price per square foot 15 cents.

1½ inch thick: Price per square foot 22 cents.

## SECTIONAL PIPE COVERINGS

MADE IN SECTIONS THREE FEET LONG — STANDARD THICKNESS

ALSO SECTIONAL COVERS FOR FITTINGS



Inside Diameter of Pipe Inches	Price Per Lineal Foot	Elbows  Each	Tees  Each	Crosses  Each	Globe Valves  Each
½	.22	.30	.36	.48	.54
¾	.24	.30	.36	.48	.54
1	.27	.30	.36	.48	.54
1¼	.30	.30	.36	.48	.54
1½	.33	.30	.36	.48	.54
2	.36	.36	.42	.54	.60
2½	.40	.42	.48	.60	.78
3	.45	.48	.54	.70	.96
3½	.50	.54	.60	.80	1.20
4	.60	.60	.75	.95	1.50
4½	.65	.72	.90	1.10	1.85
5	.70	.90	1.20	1.50	2.25
6	.80	1.30	1.60	2.00	2.80
7	1.00	1.80	2.20	2.80	3.60
8	1.10	2.40	3.00	3.60	4.40
9	1.20	3.00	3.80	4.40	5.30
10	1.30	3.60	4.60	5.20	6.20
12	1.85				

The following kinds of Sectional Coverings will be furnished from the above Uniform list prices but at different discounts.

"85 per cent. Magnesia," for high pressure work.

"Imperial Felted" Asbestos, for high pressure work.

Moulded Asbestos, for ordinary service.

Asbestos Air Cell, ½, ¾ and 1 inch thick for ordinary service.

Wool Felt, ½, ¾ and 1 inch thick for Low Pressure and Exhaust Steam, Hot and Cold water pipes.

Inquiries for discounts and orders, should state style, sizes and quantities of covering wanted.

**MAGNESIA AND ASBESTOS BLOCK AND SHEET COVERING,**  
furnished in varying sizes and up to four inches thick. Prices quoted according to size, quantity and thickness wanted.

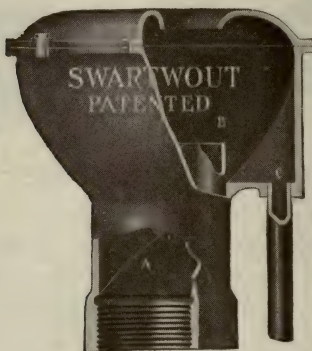
### CEMENT IN BAGS. PRICES ON APPLICATION

"85 per cent. Magnesia": Approximate weight per bag 60 pounds.

Asbestos Cement: Approximate weight per bag 100 pounds.

One bag of either will cover approximately 40 square feet of surface one inch thick.

## CAST IRON EXHAUST PIPE HEADS

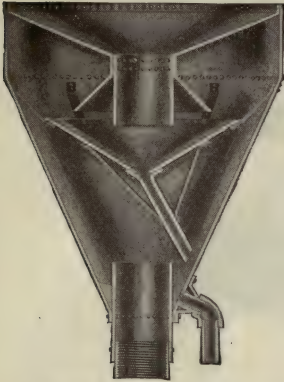


For Pipe Size Inches	Price Screwed Each	Price Flanged Each	Size of Drip Inches	Diameter of Flange Inches	Greatest Diameter Inches	Total Height Inches
1-1½	20.00		¾		7¾	7¾
2-2½	25.00		1		9	9¾
3-3½	30.00		1		10½	10⅝
4-4½	40.00		1		11½	11⅞
5	50.00		1¼		13⅞	13¼
6		60.00	1¼	11	16	14⅞
7		75.00	1¼	12½	18¼	17¼
8		90.00	1¼	13½	20	17⅞
10		125.00	2	16	23	21¾
12		150.00	2½	19	28½	25
14		200.00	2½	21	31½	27⅞
16		250.00	3	23½	34¼	30⅞
18		300.00	3	25	38	33⅞
20		360.00	3½	27½	41½	37⅞
22		450.00	3½	29½	47	43
24		600.00	4	32	51	45¾
26		700.00	4	34¼	55	50
28		800.00	4	36½	59	53
30		900.00	4½	38¾	62	57
36		1200.00	5	46	75	66¾

The flanges on Heads 6 inches and larger conform with the American Standard for Low Pressure and are furnished faced and drilled. The holes straddle center line of drip outlet.

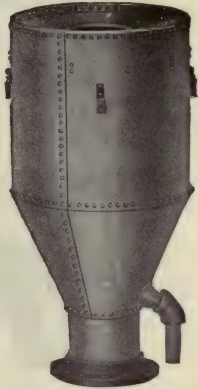
Companion flanges are furnished on sizes 6 to 10 inches, inclusive, without extra charge.

## EXHAUST PIPE HEADS



INTERIOR VIEW OF HEAD  
9 INCH AND SMALLER

Galvanized  
Sheet  
Metal



EXTERIOR VIEW OF HEAD  
10 INCH AND LARGER

For Size of Pipe Inches	Price with Screwed Coupling Each	Price with Flange Faced and Drilled Each	Size of Drip Inches	Diameter of Flange Inches	Greatest Diameter Inches	Total Height Inches
1	20.00		$\frac{3}{4}$		14	22
$1\frac{1}{4}$	20.00		$\frac{3}{4}$		14	22
$1\frac{1}{2}$	20.00		$\frac{3}{4}$		14	22
2	25.00		1		17	27
$2\frac{1}{2}$	25.00		1		17	27
3	30.00		1		20	30
$3\frac{1}{2}$	30.00		1		20	30
4	40.00		1		23	33
$4\frac{1}{2}$	40.00		1		23	33
5		50.00	$1\frac{1}{4}$	10	25	34
6		60.00	$1\frac{1}{4}$	11	29	35
7		75.00	$1\frac{1}{2}$	$12\frac{1}{2}$	31	38
8		90.00	$1\frac{1}{2}$	$13\frac{1}{2}$	34	45
9		105.00	2	15	37	46
10		125.00	$2\frac{1}{2}$	16	28	56
12		150.00	$2\frac{1}{2}$	19	30	60
14		200.00	3	21	37	68
16		250.00	3	$23\frac{1}{2}$	47	72
18		300.00	$3\frac{1}{2}$	25	46	82

Larger sizes, prices on application.

14 inch and larger sizes are fitted with lugs for attaching guy wires.

Exhaust Heads are not crated for shipment unless so ordered; an extra charge is made for crating.

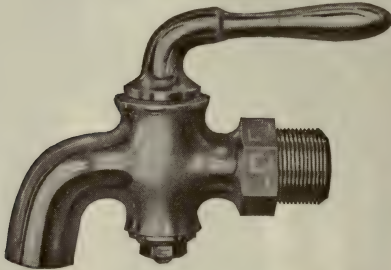
Sizes, 1 inch to  $4\frac{1}{2}$  inch, screwed; 5 inch to 18 inch, flanged.



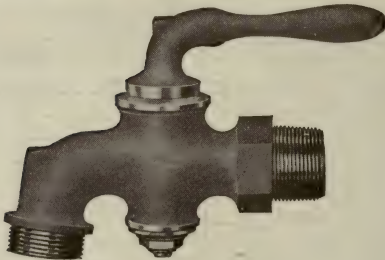
## BRASS BIBB COCKS

SCREWED FOR IRON PIPE, WITH SHOULDER

LEVER HANDLE



No. 800 FINISHED, PLAIN



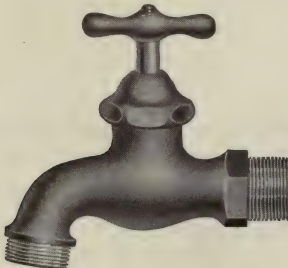
No. 800 ROUGH, FOR HOSE

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
No. 800, Rough Bibbs, Plain..... Per Dozen	20.40	21.00	29.40	36.00
No. 800, Rough Bibbs for Hose.... Per Dozen		24.00	32.40	39.00
No. 800, Finished Bibbs, Plain.... Per Dozen	25.20	25.80	35.40	45.00
No. 800, Finished Bibbs for Hose.. Per Dozen		28.80	38.40	48.00
Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 800, Rough Bibbs, Plain..... Per Dozen	52.80	89.40	149.40	258.00
No. 800, Rough Bibbs for Hose.... Per Dozen	60.00	100.20	164.40	280.20
No. 800, Finished Bibbs, Plain.... Per Dozen	64.80	107.40	179.40	300.00
No. 800, Finished Bibbs for Hose.. Per Dozen	72.00	118.20	194.40	322.20

The above Bibbs, screwed for iron pipe, will be made to order without shoulder, at same list prices as above, but at special discount.

**COMPRESSION BIBBS****SCREWED FOR IRON PIPE, WITH SHOULDER****No. 802 FINISHED**

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Rough.....Per Dozen	16.80	17.40	22.80	30.60	54.00
Finished.....Per Dozen	18.60	19.80	25.20	33.00	60.00

**No. 802 ROUGH, FOR HOSE**

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Rough, for Hose.....Per Dozen	—	20.40	25.80	33.60	61.20
Finished, for Hose.....Per Dozen	—	22.80	28.20	36.00	67.20

The above Bibbs, screwed for iron pipe, will be made to order without shoulder, at same list prices as above, but at special discount.

## HOSE



### RUBBER HOSE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Two-Ply.....Per foot	.20	.25	.33	.42	.50	.58	.66
Three-Ply.....Per foot	.25	.30	.40	.50	.60	.70	.80
Four-Ply.....Per foot	.30	.37	.50	.62	.75	.87	1.00
Size.....Inches	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	
Two-Ply.....Per foot	.75	.83	.92	.99	1.16	1.32	
Three-Ply.....Per foot	.90	1.00	1.10	1.20	1.40	1.60	
Four-Ply.....Per foot	1.12	1.25	1.37	1.50	1.75	2.00	

Five and six ply Hose made to order. Prices on application.

### STEAM HOSE

Size...Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Three-Ply..Per foot	.47	.57	.70	.85	1.02	1.18	1.34	1.50	1.66	2.00
Four-Ply..Per foot	.56	.71	.87	1.04	1.25	1.45	1.66	1.87	2.08	2.80
Five-Ply..Per foot	.70	.87	1.07	1.30	1.56	1.81	2.07	2.33	2.60	3.50
Six-Ply...Per foot	.84	1.05	1.28	1.56	1.87	2.17	2.49	2.80	3.12	4.20

### COTTON COVERED, RUBBER LINED, MILL HOSE

Size.....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Per Foot	.40	.45	.50	.65	.80

### COTTON COVERED, RUBBER LINED GARDEN HOSE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....Per foot	.20	.25	.35

Any of the above Hose can be furnished in several different grades. Prices on application.

### MARLIN OR DUCKED WRAPPED STEAM HOSE

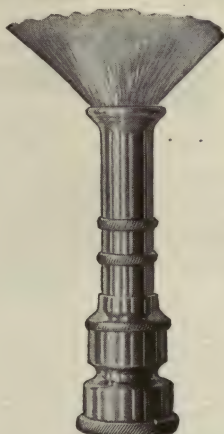
Steam Hose covered with Marlin or Duck prevents the cover from cutting, and gives it greater strength. Prices on application.

# THE GEM BRASS HOSE NOZZLES

PATENTED

EASILY  
ADJUSTED

STREAM

FREE FROM  
LEAKAGE

SPRAY

No. 904. FEMALE HOSE THREAD

Size.....Inches	$\frac{3}{4}$	1
Price.....Per dozen	10.00	15.00



No. 906. FEMALE THREAD

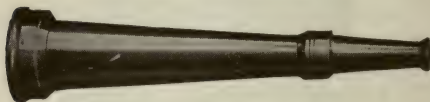


No. 908. TO WIND

Size.....Inches	$\frac{3}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Length to Screw.....Inches	3	8	4	$4\frac{3}{4}$	12	$5\frac{3}{4}$
Length to Wind.....Inches	$5\frac{1}{2}$		6			
No. 906, Hose Pipe Thread. Per dozen	4.00	7.00	5.00	12.00	18.00	18.00
No. 906, Iron Pipe Thread.. Per dozen	5.00	8.00	6.25	13.75	19.75	19.75
No. 908, to Wind.....Per dozen	4.00		9.50			
Size.....Inches	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Length to Screw.....Inches	12	$6\frac{3}{4}$	12	$7\frac{1}{2}$	12	22
No. 906, Hose Pipe Thread.. Per dozen	22.00	26.00	34.00	37.40	55.00	92.00
No. 906, Iron Pipe Thread... Per dozen	24.00	29.00	39.00	39.50	60.00	120.00

## BRASS HOSE PIPES

## SCREW TIPS



No. 900

Size.....Inches	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Length.....Inches	$7\frac{1}{2}$	12	$8\frac{1}{2}$	$12\frac{1}{2}$	12	15
Hose Pipe Thread....Per dozen	8.00	10.00	10.00	12.00	20.00	24.00
Iron Pipe Thread.....Per dozen	9.20	11.20	11.20	13.20	21.20	25.00
Size.....Inches	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	2	$2\frac{1}{2}$
Length.....Inches	13	15	12	15	20	15
Hose Pipe Thread....Per dozen	25.00	30.00	38.00	45.00	50.00	75.00
Iron Pipe Thread.....Per dozen	27.50	32.50	41.00	48.00	53.00	78.50
Size.....Inches	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$		
Length.....Inches	20	24	30	36		
Hose Pipe Thread....Per dozen	96.00	100.00	144.00	157.00		
Iron Pipe Thread.....Per dozen	99.50	103.50	150.00	163.00		

## BRASS HOSE PIPES

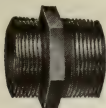
## WITH COCK



No. 902

Size.....Inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Length.....Inches	6	8	12	8	12	12	12
Hose Pipe Thread....Per dozen	11.00	13.00	18.00	15.00	20.00	40.00	55.00
Iron Pipe Thread.....Per dozen	12.20	14.20	19.20	18.00	23.00	43.00	60.00
Size.....Inches	2	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Length.....Inches	12	20	25	20	24	30	36
Hose Pipe Thread....Per dozen	80.00	110.00	130.00	160.00	175.00	195.00	215.00
Iron Pipe Thread .... Per dozen	83.00	113.00	133.00	170.00	185.00	205.00	225.00





No. 940  
MALE

## HOSE NIPPLES



No. 942  
MALE AND FEMALE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Male .....Per dozen	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00	50.00	75.00
Male and Female....Per dozen	3.50	3.50	5.00	9.00	10.00	14.00	28.00	40.00	50.00	75.00

## HOSE

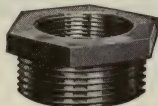


## REDUCERS

No. 944

Size.....Inches	$1\times\frac{3}{4}$	$1\frac{1}{4}\times\frac{3}{4}$	$1\frac{1}{4}\times 1$	$1\frac{1}{2}\times\frac{3}{4}$	$1\frac{1}{2}\times 1$	$1\frac{1}{2}\times 1\frac{1}{4}$	$2\times\frac{3}{4}$	$2\times 1$	$2\times 1\frac{1}{2}$
Price.....Per dozen	6.50	8.00	10.00	11.50	11.50	12.00	13.00	14.00	16.00
Size.....Inches	$2\times 1\frac{1}{2}$	$2\frac{1}{2}\times\frac{3}{4}$	$2\frac{1}{2}\times 1$	$2\frac{1}{2}\times 1\frac{1}{4}$	$2\frac{1}{2}\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2$	$3\times 2$	$3\times 2\frac{1}{2}$	
Price.....Per dozen	18.00	20.00	22.00	23.00	24.00	26.00	30.00	36.00	

## HOSE



## BUSHINGS

No. 946

Size.....Inches	$1\times\frac{3}{4}$	$1\frac{1}{4}\times\frac{3}{4}$	$1\frac{1}{4}\times 1$	$1\frac{1}{2}\times\frac{3}{4}$	$1\frac{1}{2}\times 1$	$1\frac{1}{2}\times 1\frac{1}{4}$	$2\times\frac{3}{4}$	$2\times 1$	$2\times 1\frac{1}{2}$
Price.....Per dozen	6.50	8.00	10.00	11.50	11.50	12.00	13.00	14.00	16.00
Size.....Inches	$2\times 1\frac{1}{2}$	$2\frac{1}{2}\times\frac{3}{4}$	$2\frac{1}{2}\times 1$	$2\frac{1}{2}\times 1\frac{1}{4}$	$2\frac{1}{2}\times 1\frac{1}{2}$	$2\frac{1}{2}\times 2$	$3\times 2$	$3\times 2\frac{1}{2}$	
Price.....Per dozen	18.00	20.00	22.00	23.00	24.00	26.00	30.00	36.00	

In ordering any of the above goods, specify whether Hose or Iron Pipe Thread is required.

## HOSE

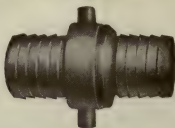


## CAPS

No. 948

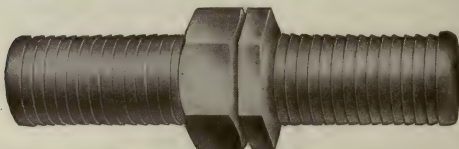
Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Per dozen	4.00	6.00	8.00	10.00	15.00	24.00	31.00	39.00	43.00

Sample of Hose Thread required, preferably the Male end of a hose coupling, must be furnished with order.

**BRASS HOSE COUPLINGS****No. 920**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Hose Pipe Thread....Per dozen	2.40	2.40	4.40	10.00	14.00	24.00	48.00
Iron Pipe Thread....Per dozen	2.65	2.65	4.65	10.50	15.00	26.00	50.00
Size.....Inches	3	$3\frac{1}{2}$	4	5	6	8	
Hose Pipe Thread....Per dozen	75.00						
Iron Pipe Thread....Per dozen	76.00	120.00	150.00	250.00	500.00	600.00	

In ordering, specify whether Hose, or Iron Pipe Thread is required.

**BRASS STEAM HOSE COUPLINGS****No 924**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....Per dozen	15.00	15.00	18.00	24.00	30.00	42.00	72.00

In ordering, specify whether Hose, or Iron Pipe Thread is required.

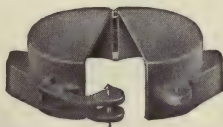
**IRON HOSE SPLICES  
FOR MENDING HOSE****No. 930**

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....Per dozen	.60	.75	1.00

## BRASS SIAMESE CONNECTION FOR STAND PIPES



No. 950

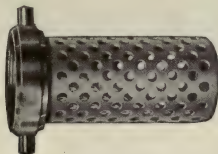
MORSE CAP  
CAST IRON

Size, Iron Pipe.....	Inches	3	4
Size, Both Nozzles.....	Inches	2½	2½
Price, Siamese Connection.....	Each	15.00	18.00
Price, Morse Cap, Extra.....	Each	1.50	1.50

The Hose Connections are threaded Chicago Fire Department Standard. Can furnish any thread desired upon receipt of sample.

Morse Caps for Fehy Connections and 3 inch Morse Caps for New York Fittings can also be furnished. Prices upon application.

## BRASS SUCTION HOSE STRAINERS



No. 952

Size.....	Inches	2	2½	3	4	5	6
Price.....	Each	7.50	8.50	10.00	19.00	31.00	46.00

In ordering, specify whether Hose, or Iron Pipe Thread is required.

## HOSE SPANNERS



No. 954

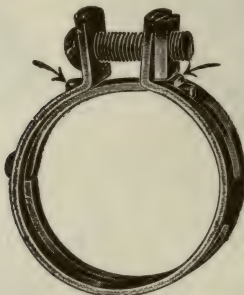
MALLEABLE IRON

Size.....	Inches	1¼	1½	2	2½
Price.....	Each	.12	.15	.20	.25

# IMPROVED HOSE CLAMPS

MADE OF GALVANIZED STEEL

POSITIVE GRIP, STRONG AND DURABLE



No. 927

## GALVANIZED STEEL CLAMPS FOR WATER HOSE

Size Hose Inches	Ply of Hose	Inside Diameter of Clamp when Open $\frac{1}{2}$ to $\frac{3}{4}$ inch Between Ears	Price Per Dozen	Number of Dozen in a Box
$\frac{1}{2}$	3, 4 and 5	$\frac{7}{8}$ to $1\frac{1}{16}$	1.50	12
$\frac{3}{4}$	2, 3, 4 and 5	$1\frac{1}{8}$ to $1\frac{5}{16}$	1.50	12
1	3 and 4	$1\frac{7}{8}$ to $1\frac{1}{2}$	2.00	6
$1\frac{1}{4}$	3 and 4	$1\frac{3}{4}$ to $1\frac{7}{8}$	2.50	3
$1\frac{1}{2}$	3 and 4	2 to $2\frac{1}{8}$	3.00	3
2	3 and 4	$2\frac{7}{16}$ to $2\frac{1}{2}$	4.00	2
$2\frac{1}{2}$	3, 4, and 5	3 to $3\frac{1}{8}$	7.00	1
3	3, 4, 5, and 6	$3\frac{7}{16}$ to $3\frac{3}{4}$	10.00	1

No. 929

## GALVANIZED STEEL CLAMPS FOR STEAM HOSE

Size Hose Inches	Ply of Hose	Inside Diameter of Clamp when Open $\frac{3}{4}$ inch Between Ears	Price Per Dozen	Number of Dozen in a Box
$\frac{3}{4}$	4 and 5	$1\frac{7}{16}$ to $1\frac{1}{2}$	2.00	12
1	4, 5, and 6	$1\frac{3}{4}$ to $1\frac{7}{8}$	2.50	12
$1\frac{1}{4}$	4, 5 and 6	$1\frac{15}{16}$ to $2\frac{1}{16}$	3.00	3
$1\frac{1}{2}$	4, 5 and 6	$2\frac{1}{4}$ to $2\frac{3}{8}$	3.50	3
2	4, 5 and 6	$2\frac{11}{16}$ to $2\frac{7}{8}$	5.50	2
$2\frac{1}{2}$	4, 5 and 6	3 to $3\frac{1}{8}$	8.50	1

Larger size Clamps, prices on application.

In ordering, always specify the size and ply of hose.

## HYDRANT CLAMPS



Size of Cock to be used with.....Inches	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 850, Mall. Iron, with $\frac{3}{8}$ inch square hole. Per Lb.	.15	.15	.15		
No. 850, Mall. Iron, with $\frac{7}{16}$ inch square hole. Per Lb.	.15	.15	.15	.15	.15
No. 850, Mall. Iron, with $\frac{1}{2}$ inch square hole. Per Lb.	.15	.15	.15	.15	.15
No. 850, Mall. Iron, tapped for $\frac{3}{8}$ inch pipe. Per Lb.	.18	.18	.18	.18	.18
No. 850, Mall. Iron, tapped for $\frac{3}{8}$ in. pipe, Galv. Per Lb.	.25	.25	.25	.25	.25
No. 850, Mall. Iron, tapped for $\frac{1}{2}$ inch pipe. Per Lb.	.20	.20	.20	.20	.20
No. 852, Brass.....Each	.20	.20	.25	.30	

## WOOD ROD COUPLINGS



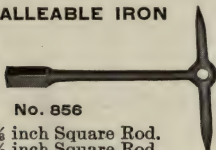
No. 854. MALLEABLE IRON

These couplings have  $\frac{3}{8}$  inch pipe thread and may be used with 1 or  $1\frac{1}{8}$  inch square rod.

Price, Plain.....	Per Set	.40
Price, Galvanized.....	Per Set	.50

## STREET WASHER KEYS

MALLEABLE IRON



No. 856

To fit  $\frac{3}{8}$  inch Square Rod.  
To fit  $\frac{1}{2}$  inch Square Rod.

LENGTH, 8 $\frac{3}{4}$  INCHES

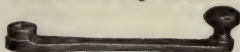
Price.....	Per Pound	.15
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## HYDRANT HANDLES

MALLEABLE IRON



No. 858

With  $\frac{3}{8}$  inch Pipe Thread.

No. 860

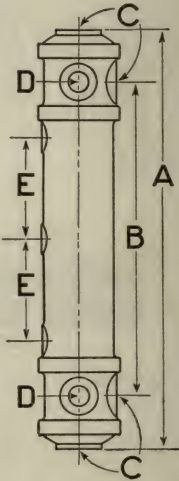
To fit  $\frac{3}{8}$  inch Square Rod.

Price, No. 858....	Per Pound	.20
Price, No. 860....	Per Pound	.15



WATER COLUMNS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 640

Number.....	1	2	3	4
Price—Bodies Only, Tapped and Painted . Each	2.75	4.00	6.00	8.00
A—Length Over All.....Inches	13 <sup>3</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>4</sub>	18 <sup>7</sup> / <sub>8</sub>	23 <sup>5</sup> / <sub>8</sub>
B—Center to Center of Boiler and Water Gauge Connections. Ins.	10	12 <sup>1</sup> / <sub>2</sub>	14	18
C—Size of Boiler and End Connections. Inches	1 <sup>1</sup> / <sub>2</sub>	3 <sup>4</sup> / <sub>4</sub>	1	1 <sup>1</sup> / <sub>4</sub>
D—Size of Water Gauge Connections...Inches	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	3 <sup>4</sup> / <sub>4</sub>	3 <sup>4</sup> / <sub>4</sub>
E—Center to Center of Gauge Cock Connections. . . . Inches	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	4
Number of Gauge Cock Tappings.....	2	3	3	3
F—Size of Gauge Cock Connections....Inches	3 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	3 <sup>4</sup> / <sub>4</sub>

When complete Water Columns are ordered we will furnish them with trimmings suitable for 175 pounds working pressure, unless otherwise specified.

# SPECIFICATIONS FOR WATER COLUMN TRIMMINGS

## TRIMMINGS THAT ARE STANDARD FOR ALL PRESSURES

Number.....	1	2	3	4
Iron Case Steam Gauge, Bourdon Spring.. Dia., Inches	5	5	6	6
Syphon for Steam Gauge..... Size, Inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Bushing for Syphon..... Size, Inches	$\frac{1}{2} \times \frac{1}{4}$	$\frac{3}{4} \times \frac{1}{4}$	$1 \times \frac{1}{4}$	$1\frac{1}{4} \times \frac{1}{4}$
Bushing for Globe Valve..... Size, Inches		$\frac{3}{4} \times \frac{1}{2}$	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{3}{4}$
Nipple for Globe Valve..... Size, Inches	$\frac{1}{2} \times 1\frac{1}{2}$	$\frac{1}{2} \times 1\frac{1}{2}$	$\frac{3}{4} \times 2$	$\frac{3}{4} \times 2$

### TRIMMINGS FOR LOW PRESSURE

Number.....	1	2	3	4
Gauge Cocks..... Size, Inches	2— $\frac{3}{8}$ No. 730	3— $\frac{1}{2}$ No. 730	3— $\frac{1}{2}$ No. 730	3— $\frac{3}{4}$ No. 732
Water Gauge..... Size, Inches	$\frac{1}{2}$ No. 624 10 inch Centers	$\frac{1}{2}$ No. 624 12 $\frac{1}{2}$ inch Centers	$\frac{3}{4}$ No. 610 14 inch Centers	$\frac{3}{4}$ No. 610 18 inch Centers
Globe Valve for Drain..... Size, Inches	$\frac{1}{2}$ No. 1	$\frac{1}{2}$ No. 1	$\frac{3}{4}$ No. 1	$\frac{3}{4}$ No. 1

### TRIMMINGS FOR WORKING PRESSURES UP TO 175 POUNDS

Number.....	1	2	3	4
Gauge Cocks.....	2— $\frac{3}{8}$ No. 734	3— $\frac{1}{2}$ No. 734	3— $\frac{1}{2}$ No. 734	3— $\frac{3}{4}$ No. 734
Water Gauge.....	$\frac{1}{2}$ No. 610 10 inch Centers	$\frac{1}{2}$ No. 610 12 $\frac{1}{2}$ inch Centers	$\frac{3}{4}$ No. 610 14 inch Centers	$\frac{3}{4}$ No. 610 18 inch Centers
Globe Valve for Drain.....	$\frac{1}{2}$ No. 70	$\frac{1}{2}$ No. 70	$\frac{3}{4}$ No. 70	$\frac{3}{4}$ No. 70

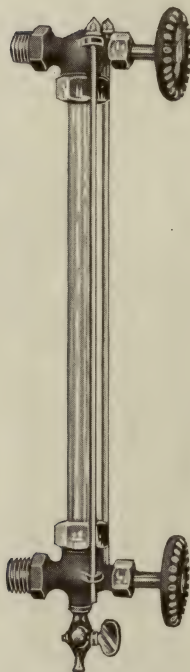
### TRIMMINGS FOR WORKING PRESSURES UP TO 250 POUNDS

Number.....	2	3	4
Gauge Cocks..... Size, Inches	3— $\frac{1}{2}$ No. 736	3— $\frac{1}{2}$ No. 736	3— $\frac{3}{4}$ No. 736
Water Gauge..... Size, Inches	$\frac{1}{2}$ No. 616 12 $\frac{1}{2}$ inch Centers	$\frac{3}{4}$ No. 613 14 inch Centers	$\frac{3}{4}$ No. 613 18 inch Centers
Globe Valve for Drain..... Size, Inches	$\frac{1}{2}$ No. 82-E	$\frac{3}{4}$ No. 82-E	$\frac{3}{4}$ No. 82-E

# LOW PRESSURE WATER GAUGES

BRASS

IRON WHEELS



No. 624

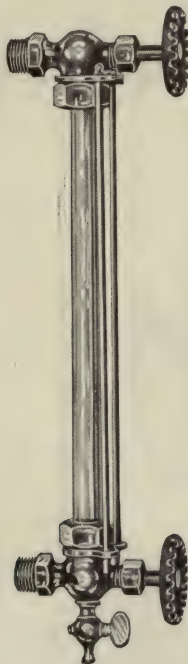
Size. ....	Inches	$\frac{1}{2}$
Rough, Bronzed. ....	Each	3.25
Size of Glass. ....	Inches	$\frac{5}{8} \times 12$
Center to Center of Cocks. ....	Inches	$13\frac{5}{8}$

# MEDIUM WATER GAUGES

BRASS

IRON WHEELS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 610

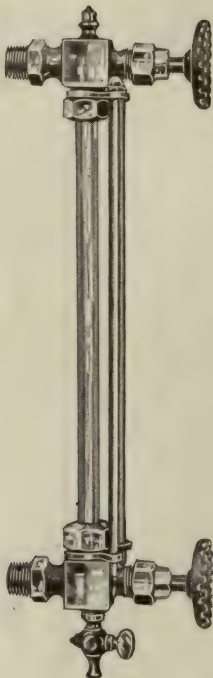
Size.....	Inches	$\frac{1}{2}$	$\frac{3}{4}$
Finished.....	Each	5.50	8.00
Size of Glass.....	Inches	$\frac{5}{8} \times 12$	$\frac{3}{4} \times 16$
Center to Center of Cocks.....	Inches	$13\frac{3}{4}$	$18\frac{1}{4}$

# EXTRA HEAVY WATER GAUGES

BRASS

IRON WHEELS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 616

Size.....	Inches	$\frac{1}{2}$
Finished.....	Each	6.50
Size of Glass.....	Inches	$\frac{1}{2} \times 12$
Center to Center of Cocks.....	Inches	14

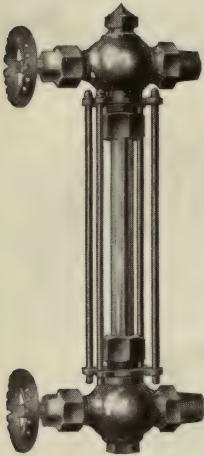


## EXTRA HEAVY WATER GAUGES

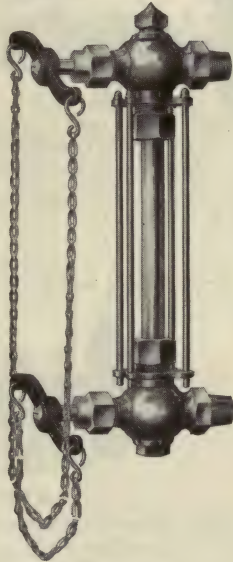
BRASS

IRON WHEELS AND LEVERS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 613



No. 615

Size .....	Inches	$\frac{3}{4}$
No. 613, Finished .....	Each	20.00
No. 615 Finished .....	Each	35.00
Size of Glass .....	Inches	$\frac{5}{8} \times 16$
Center to Center of Cocks .....	Inches	$19\frac{1}{4}$

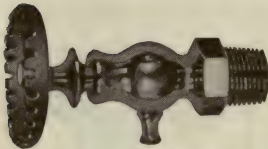
Both of the above Gauges are tapped for  $\frac{3}{8}$  inch drain.

The glass can be replaced through the cap at the top while the boiler is under pressure by closing both valves.

The No. 615 is furnished complete with lever chain that drops  $12\frac{1}{2}$  feet below the bottom valve. When valves are open, the levers stand in a horizontal position. To close pull down the right side of levers to a 45 degree angle. These Water Gauges are especially adapted for boilers, which locate the Gauge above the reach of the operator. If the glass breaks, the engineer or fireman can close the gauge by a slight pull on the chain without danger of being scalded or burned.

COMPRESSION GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



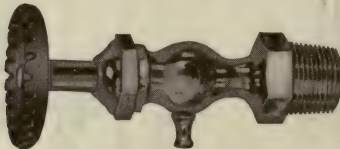
No. 730  
SHORT PATTERN



No. 732  
LONG PATTERN

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 730.....Each	.95	1.00	
No. 732.....Each		1.20	1.35

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 734  
WITH STUFFING BOX

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price.....Each	1.20	1.30	1.45

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

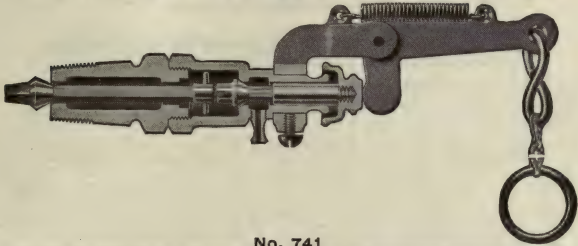


No. 736  
WITH STUFFING BOX

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$
Price.....Each	1.50	1.70

## CHAIN AND LEVER GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



No. 741

Size.....	Inches	$\frac{3}{4}$
Price, complete with Chain.....	Each	8.50

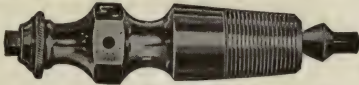
These Cocks are furnished complete with lever chains that drop 12½ feet below the Cock.

These Cocks are made with malleable iron levers, and fitted with double Valves.

The outer or secondary Valve can be removed and ground in when the boiler is under pressure. As these Gauge Cocks can be very easily tried from the floor by use of the chain, the fireman will give much more attention to the water level in his boiler and not depend entirely on the water gauge.

## MISSISSIPPI GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 175 POUNDS



No. 738

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price.....	Each	.90	1.20	1.80

## BALL GAUGE COCKS

FOR STEAM WORKING PRESSURES UP TO 100 POUNDS

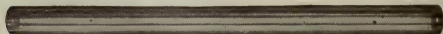


No. 740

Size.....	Inches	$\frac{1}{2}$	$\frac{3}{4}$
Price.....	Each	1.00	1.00

## SCOTCH GLASS TUBES

### FOR WATER GAUGES

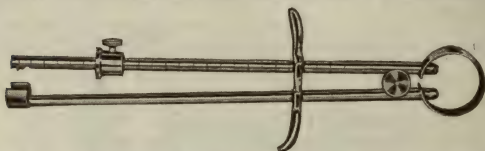


Length.....Inches	10	11	12	13	14	15	16	17
$\frac{5}{8}$ inch.....Per dozen	3.00	3.24	3.60	3.84	4.20	4.44	4.80	5.04
$\frac{3}{4}$ inch.....Per dozen	3.60	3.96	4.32	4.80	5.16	5.52	5.88	6.24
Length.....Inches	18	19	20	22	24	30	36	
$\frac{5}{8}$ inch.....Per dozen	5.40	5.64	6.00	6.60	7.20	9.00	10.80	
$\frac{3}{4}$ inch.....Per dozen	6.60	7.08	7.44	8.16	8.88	11.16	13.44	

$\frac{1}{2}$  inch Glass Tubes same list as  $\frac{5}{8}$  inch.  
 Sizes over 24 inches, special discount.

## GLASS TUBE CUTTERS

### FOR CUTTING GAUGE GLASSES TO LENGTH



One arm has a scale in inches and fractions of an inch, a slide stop with set screw, and a rotary cutter at the end. This arm is inserted in the end of the glass tube to the required distance, against the slide stop or gauge, the outside of the glass tube resting in the circled end of the other arm. With a slight pressure of thumb and finger on the lever, and a rotation of the glass with the other hand, the rotary cutter makes an even cut around the inside of the tube and a very little pressure breaks it off.

Price, Tube Cutter Complete.....	Each	2.00
Price, extra Cutter Wheels.....	Each, Net	.15

## EXTRA BRASS GUARDS

### FOR WATER GAUGES

17½ inches long.....	Each	.15
14½ inches long.....	Each	.08

Longer Guards to order.

## RUBBER WASHERS

### FOR WATER GAUGES

Price.....	Per dozen, Net	.12
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## SINGLE BOURDON SPRING PRESSURE AND VACUUM GAUGES



PRESSURE GAUGE



VACUUM GAUGE

Size Dial	Iron Case with Brass Ring	Iron Case with N. P. Ring	Brass Case	Brass Case Nickel Plated All Over Each	STANDARD Graduations of Dial Pressures
Inches	Each	Each	Each	Each	
12	50.00	51.50	75.00	79.00	30-100-200 300-500
10	32.00	33.00	40.00	43.00	
8½	22.00	22.75	30.00	32.50	
6¾	16.00	16.60	20.00	22.00	
6	13.00	13.50	16.00	17.50	30-60-100 160-200-300 500
5½	10.00	10.25	12.00	13.25	
5	8.00	8.20	11.00	12.00	
4½	8.00	8.20	10.00	11.00	
3½	7.00	7.18	9.00	9.75	30-60-100 160-200-300
3	6.00	6.15	8.00	8.60	
2½	6.00	6.15	8.00	8.60	
2	6.00	6.15	8.00	8.60	

Unless otherwise specified, Iron Case Gauge with Brass Ring will always be furnished.

Double Bourdon Spring Gauges: Prices on application.

Above prices, 3 inch and larger, include Cocks with each Gauge. On smaller sizes, Cocks will be furnished at an extra price.

No Steam Gauge warranted unless properly connected with Syphon.

When ordering, do not fail to state: Size Dial and Style of Gauge; also the maximum pressure to which the dial is to be graduated. Graduations ordered other than specified in above table of Standards, will be considered special and an extra price charged.

Vacuum Gauges, unless otherwise specified, will always be furnished graduated to 30 inches. They can be graduated to equivalent in pounds, instead of inches, if so stated when ordering.

Extra charge made for name on dials.

## SYPHON FOR STEAM GAUGES



Size . . . . .	Inch	¼
Price, length 8 inches . . . . .	Each	.50



## COMPOUND AND COMBINATION PRESSURE AND VACUUM GAUGES



**COMPOUND PRESSURE  
AND VACUUM GAUGE**



**COMBINATION WATER  
PRESSURE GAUGE**

Size Dial	Iron Case with Brass Ring	Iron Case with N. P. Ring	Brass Case	Brass Case Nickel Plated all Over
Inches	Each	Each	Each	Each
12	60.00	61.50	80.00	84.00
10	40.00	41.00	50.00	53.00
8½	30.00	30.75	40.00	42.50
6¾	20.00	20.60	25.00	27.00
6	16.00	16.50	20.00	21.50
5½	14.00	14.25	16.00	17.25
*5	14.00	14.25	16.00	17.25
4½	12.00	12.20	14.00	15.00
†3½	10.00	10.18	12.00	12.75

\* The 5 inch Combination Water Pressure Gauges take the same list prices as the 4½ dial.

† The 3½ inch size is not made in the Combination Water Pressure Gauge.

Unless otherwise specified, Iron Case Gauge with Brass Ring will always be furnished.

Above prices include Cock with each Gauge.

No Steam Gauge warranted unless properly connected with Syphon.

When ordering, do not fail to state size Dial and Style of Gauge, also the maximum pressure to which the Dial is to be graduated.

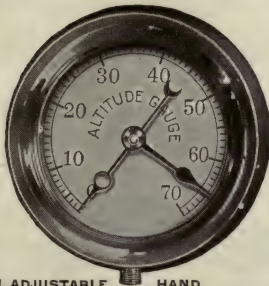
The Standard Graduations for all sizes Compound Pressure and Vacuum Gauges are—30, 60, 100 and 160 pounds pressure and 30 inches vacuum, and for Combination Water Pressure Gauges, 100, 200 and 300 pounds pressure and equivalent in feet. Any other Dial Graduations ordered will be considered special and an extra price charged.

The Vacuum side of the Compound Gauge can be graduated to equivalent in pounds, instead of inches, if so stated when ordering.

Extra charge made for name on Dials.

## ALTITUDE

Gauges will be furnished graduated to a maximum of 70 feet. Any other variation, will be at an extra price.



WITH ADJUSTABLE HAND

## GAUGES

Unless otherwise ordered, Iron Case Gauge with Brass Ring, will always be furnished. Prices include Cock with each Gauge.

Size Dial Inches	Iron Case with Brass Ring Each	Iron Case with N. P. Ring Each	Brass Case Each	Brass Case Nickel Plated All Over Each
12	60.00	61.50	80.00	84.00
10	40.00	41.00	50.00	53.00
8½	30.00	30.75	40.00	42.50
6¾	20.00	20.60	25.00	27.00
6	16.00	16.50	20.00	21.50
5½	14.00	14.25	16.00	17.25
5	12.00	12.20	14.00	15.00
4½	12.00	12.20	14.00	15.00

## HYDRAULIC

When ordering, state the maximum pressure to which the Gauge is to be graduated. All Gauges should be graduated to double their working pressure. Hydraulic Cock and Check Valves, extra.



WITH STEEL SPRING

## GAUGES

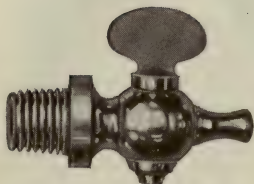
If a double scale, showing pounds pressure per square inch and tons on Ram is required, state the diameter of Ram and the number of tons to which the Gauge is to be graduated.

Size Dial Inches	Iron Case with Brass Ring Each	Iron Case with N. P. Ring Each	Brass Case Each	Brass Case Nickel Plated All Over Each
8½	70.00	70.75	80.00	82.50
6¾	50.00	50.60	60.00	62.00
6	35.00	35.50	40.00	41.50
5	30.00	30.50	35.00	36.00
4½	25.00	25.50	30.00	31.00

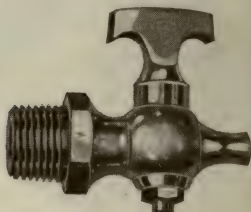
For Gauges with Maximum Hand, add \$5.00 to List Prices.

# STEAM GAUGE AND AIR COCKS

## TEE OR LEVER HANDLE

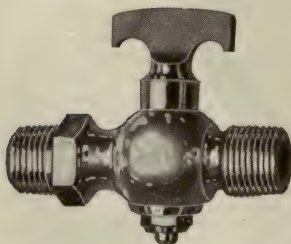


**STANDARD PATTERN**  
**No. 700 TEE HANDLE**  
**No. 702 LEVER HANDLE**

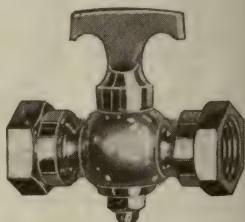


**HEAVY PATTERN**  
**No. 704 TEE HANDLE**  
**No. 706 LEVER HANDLE**

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 700, Tee Handle.....Each	.40	.45	.50	.60
No. 702, Lever Handle.....Each	.55	.60	.65	.75
No. 704, Tee Handle.....Each		.80	.85	.90
No. 706, Lever Handle.....Each		.95	1.00	1.05



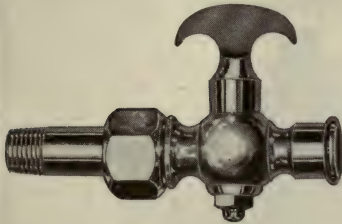
**No. 708 TEE HANDLE**  
**No. 710 LEVER HANDLE**



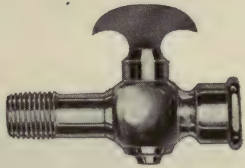
**No. 712 TEE HANDLE**  
**No. 714 LEVER HANDLE**

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 708, Tee Handle, Male.....Each	.55	.65	.75
No. 710, Lever Handle, Male.....Each	.70	.80	.90
No. 712, Tee Handle, Female.....Each	.75	.85	.95
No. 714, Lever Handle, Female.....Each	.90	1.00	1.10

## STEAM GAUGE COCKS



No. 742  
WITH UNION COUPLING



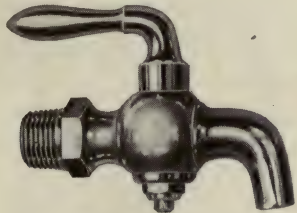
No. 744

Size.....	Inches	
No. 742, with Union, Male and Female.....	Each	1.75
No. 744, Male and Female.....	Each	.75

## CYLINDER COCKS



No. 720  
WITH UNION COUPLING



No. 724  
WITH BIBB

### WITH UNION COUPLING

Size.....	Inches	$\frac{3}{8} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{3}{4} \times \frac{3}{8}$
No. 720, Lever Handle.....	Each	2.00	2.50	3.75

The union end of these Cocks is the smaller end.

### WITH BIBB

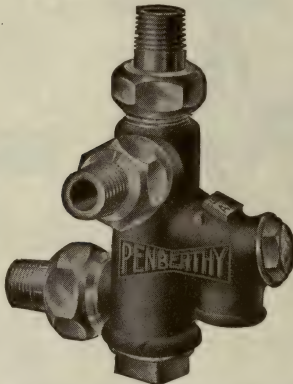
Size.....	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 722, Tee Handle.....	Each	.70	1.00	1.15	1.60	2.35
No. 724, Lever Handle.....	Each	.85	1.15	1.30	1.85	2.60

# PENBERTHY AUTOMATIC INJECTOR

STYLE—LEFT AND BACK

## TO START

Open full the globe valve in water supply first, and then globe valve in steam pipe. If water issues from overflow, throttle the water supply valve until discharge stops.



## TO STOP

Close the steam valve. The water valve need not be closed unless the Injector is used as a non-lifter, or lift is considerable.

## CUT No. 47—STOCK INJECTOR

SUCTION LEFT—OVERFLOW FRONT—DISCHARGE BACK

Order by Size No.	Price	Pipe Connections all around Inches	CAPACITY PER HOUR 1 to 3 Feet Lift 60 to 85 Pounds Steam Pressure		Nominal Horse-Power
			Maximum Gallons	Minimum Gallons	
O	15.00	$\frac{1}{4}$	60	35	3 to 6
OO	16.00	$\frac{3}{8}$	80	45	4 to 8
A	18.00	$\frac{1}{2}$	135	70	8 to 16
AA	20.00	$\frac{1}{2}$	180	100	12 to 22
B	25.00	$\frac{3}{4}$	260	140	17 to 32
BB	30.00	$\frac{3}{4}$	360	180	20 to 45
C	40.00	1	475	250	40 to 65
CC	45.00	1	600	325	45 to 80
D	55.00	$1\frac{1}{4}$	800	425	50 to 100
DD	60.00	$1\frac{1}{4}$	1000	525	75 to 135
E	75.00	$1\frac{1}{2}$	1400	740	100 to 180
EE	90.00	$1\frac{1}{2}$	1900	850	115 to 255
F	110.00	2	2400	1275	160 to 320
FF	125.00	2	3000	1600	200 to 400
G	150.00	$2\frac{1}{2}$	3600	1875	300 to 500
GG	200.00	$2\frac{1}{2}$	4200	2150	375 to 600

The capacity can be cut down about one half by simply throttling the water supply Valve.

Where Injectors are ordered by size pipe connections, we will always send the size having the largest capacity.



# THE PENBERTHY EJECTOR

## SYPHON OR STEAM JET PUMP



LIFTS 22 TO 25 FEET

ELEVATES 50 TO 75 FEET

"X L-96"

Order By Size	Price All Brass	Price Iron Body; Brass Jets	PIPE CONNECTIONS		CAPACITY PER HOUR			
			Steam	Suction and Deliv'y	40 to 65 Lbs. Steam, 3 ft. Lift	20 to 40 Lbs., or 65 to 100 Lbs. Elevation	40 to 65 Lbs. 50 feet Elevation	40 to 65 Lbs. 25 feet Elevation
Number	Each	Each	Inches	Inches	Gallons	Gallons	Gallons	Gallons
1	8.00	Sizes 1 to 4 made in All Brass only	$\frac{3}{8}$	$\frac{1}{2}$	240	235	120	180
2	10.00		$\frac{1}{2}$	$\frac{3}{4}$	500	450	250	375
3	15.00		$\frac{3}{4}$	1	840	700	420	625
4	20.00		1	$1\frac{1}{4}$	1,350	1,300	650	950
5	25.00	20.00	1	$1\frac{1}{2}$	1,950	1,850	975	1,450
6	35.00	27.50	$1\frac{1}{4}$	2	3,500	3,000	1,750	2,600
7*	50.00	40.00	$1\frac{1}{2}$	$2\frac{1}{2}$	5,700	4,350	2,500	3,750
8*	70.00	50.00	2	3	9,500	8,160	4,750	7,200
9*	105.00	70.00	2	$3\frac{1}{2}$	13,600	12,400	6,800	10,200
10*	145.00	95.00	$2\frac{1}{2}$	4	18,400	17,100	9,200	13,800

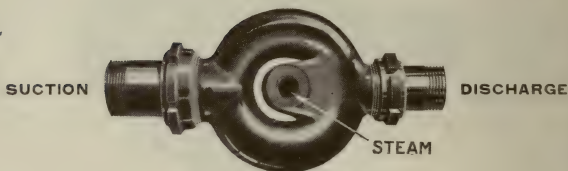
Sizes 5 and 6 will be sent in brass unless ordered of iron.

\*Unless ordered in brass, sizes 7 to 9, inclusive, will be shipped with iron body, brass jets and steam connection, and size 10, all iron except jets. The jets in all sizes are made of a special hard metal, insuring good wearing qualities.

When a 1 inch Ejector is ordered we send No. 3, not No. 4 or 5, etc.

Strainers are not included in price of Ejectors.

# BLAKESLEE'S STEAM JET PUMPS OR EJECTORS



Size of Pump Inches	Suction Pipe Inches	Discharge Pipe Inches	Steam Pipe Inches	Steam Opening	Capacity per Minute Gallons	Price Each
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	3-16	8	8.00
1	1	$\frac{3}{4}$	$\frac{1}{2}$	4-16	15	10.00
$1\frac{1}{4}$	$1\frac{1}{4}$	1	$\frac{1}{2}$	5-16	20	12.00
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	6-16	30	14.00
2	2	$1\frac{1}{2}$	$\frac{3}{4}$	7-16	40	16.00
$2\frac{1}{2}$	$2\frac{1}{2}$	2	1	8-16	50	20.00
3	3	$2\frac{1}{2}$	1	9-16	60	24.00

The above capacities are based on 50 pound steam pressure.

The limit of perpendicular suction is 14 feet and will require steam pressure of 25 pounds or above.

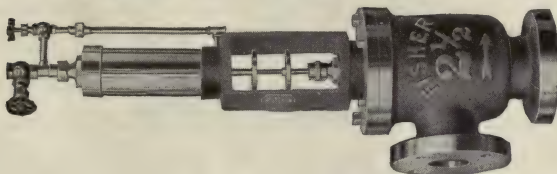
Special Pumps furnished for higher suction power.

Liquids may be forced to an elevation equal to about one foot to each pound steam pressure. We, however, recommend two Pumps, one placed above the other, for elevations above 50 feet.

These Pumps will work in any position.

# STEAM PUMP GOVERNORS

SUITABLE FOR A DISCHARGE PRESSURE OF FROM 5 TO 500 POUNDS



Size of Valve Inches	Price List			DIMENSIONS										WEIGHTS	
	Globe or Angle Pattern	Angle Pattern Flanged, Each	Globe Pattern Flanged, Each	Diameter of Flanges Inches	Distance End to End Screwed Globe Inches	Distance End to End Flanged Globe Inches	Center to Face of Inlet Screwed Angle Inches	Center to Face of Outlet Screwed Angle Inches	Center to Face Flanged Angle Inches	Center to Face Flanged Angle Inches	Center to Face of Outlet Screwed Angle Inches	Height over all Screwed Inches	Height over all Flanged Inches	Approximate Shipping Weight, Screwed Pounds	Approximate Shipping Weight, Flanged Pounds
1 1/2	25.00				4 1/2		2 1/2	2 3/8				20 1/2		16	
3/4	27.50				4 1/2		2 1/2	2 3/8				20 1/2		17	
1	30.00	35.00	37.50	4 1/2	5 7/8	6 1/2	3 1/8	3 5/8	3 1/4	3 3/8	27 3/8	26 7/8		35	41
1 1/4	35.00	40.00	42.50	5	6 3/4	7 1/8	3 1/8	3 5/8	3 1/4	3 3/8	27 3/8	27		40	44
1 1/2	42.50	45.00	47.50	6	7	8 1/8	3 1/2	3 7/8	4 1/4	4 1/8	27 1/2	28 3/8		54	75
2	50.00	50.00	52.50	6 1/2	8 3/4	9 1/2	4 3/8	4 5/8	4 7/8	4 1/2	30	29 5/8		58	90
2 1/2	58.00	60.00	63.00	7 1/2	9	10 1/4	4 1/2	4 7/8	5 1/8	5 1/4	30 1/2	30 1/2		90	110
3	70.00	75.00	78.50	8 3/4	10	11 1/4	5	5 1/4	5 5/8	5 3/4	32 1/8	31 3/4		100	132
3 1/2		87.50	90.00	9		12			6	6 3/8		33			155
4		100.00	105.00	10		12 3/4			6 3/4	6 3/4		34			186
5		125.00	130.00	11		13 1/2			6 7/8	7 1/8		35 1/8			200
6		150.00	160.00	12 1/2		15 1/8			7 1/8	8 1/8		36 1/8			225
8		225.00	235.00	15		17			8 1/2	9 1/8		37 1/8			300

When ordering, always give both the steam and water working pressures and state whether angle or globe pattern is desired. The angle pattern will be furnished, unless otherwise specified, with screwed ends up to 3 inch, inclusive, and the larger sizes with flanged ends.

Companion flanges, bolts and gaskets are furnished with all Flanged Valves, unless the dimensions of flanges differ from those given in above table. In such cases, an extra charge will be made.

BRASS STEAM WHISTLES

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



No. 600  
WITH LEVER VALVE



No. 602  
WITHOUT VALVE



No. 608  
WHISTLE VALVE

WHISTLES

Diameter of Bell.....Inches	1	1¼	1½	2	2½	3	3½
Length of Bell.....Inches	2½	3	3¼	4	4½	5	5¾
Size of Pipe.....Inches	¼	¼	⅜	½	¾	¾	1
No. 600.....Each	3.10	3.75	4.00	5.50	6.50	8.50	11.50
No. 602.....Each	2.20	2.75	3.00	4.35	5.25	7.25	9.50
Diameter of Bell.....Inches	4	5	6	8	10	12	
Length of Bell.....Inches	6½	8	9½	14	16	22	
Size of Pipe.....Inches	1¼	1½	2	2½	3	3	
No. 600.....Each	15.00	22.50	33.00	95.00	225.00	425.00	
No. 602.....Each	12.00	19.00	24.00	70.00	175.00	350.00	

WHISTLE VALVES

Size.....Inches	⅜	½	¾	1	1¼	1½	2	2½	3
No. 608.....Each	2.00	2.50	3.00	3.50	5.00	6.00	9.00	18.00	27.00

Brass Whistles with longer bell than standard, made to order at an extra price.

Always order Whistles by the diameter of bell and not by the size of pipe.

Whistles for higher pressures made to order at an extra price.

## MOCKING BIRD STEAM OR AIR WHISTLES

FOR STEAM OR AIR WORKING PRESSURES  
UP TO 125 POUNDS

Diameter of Bell . Inches	3	4	5	6
Length of Bell . . . Inches	9	12	15	18
Size of Pipe . . . . . Inches	1	1¼	1½	2
No. 604 . . . . . Each	40.00	53.00	70.00	95.00

This improved piston Whistle is particularly adapted for river boats, fog signals, fire alarms, etc., making a different sound from the ordinary steam whistle, being so constructed that the sound can be changed instantly, whereby boats, etc., using them, can be easily distinguished at a long distance.

Always order Whistles by the diameter of the bell, and not by the size of pipe.

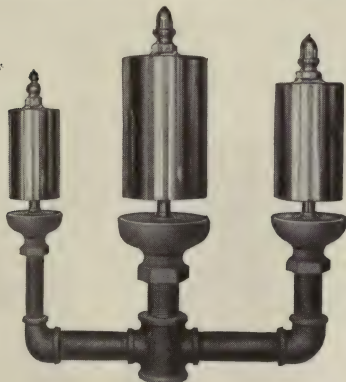
No. 604

## CHIME STEAM WHISTLES

BRASS, WITH IRON PIPE AND FITTINGS

Any Number or  
Size of Bells  
Made to Order

PRICES  
ON  
APPLICATION



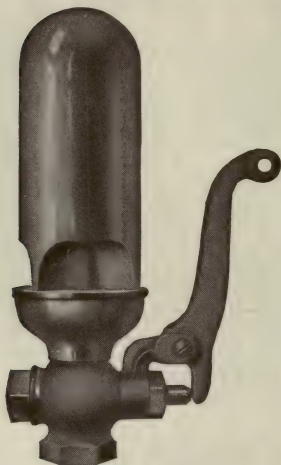
No. 606



# SINGLE BELL CHIME WHISTLES

FOR COMPRESSED AIR

SUITABLE FOR WORKING PRESSURES FROM 25 TO 150 POUNDS



**No. 607  
WITH LEVER VALVE**



**No. 607½  
WITHOUT VALVE**

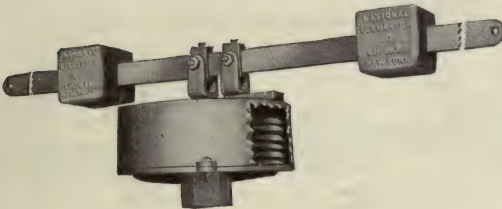
Diameter of Bell Inches	Size of Pipe Inches	No. 607 With Lever Valve Each	No. 607½ Without Valve Each
1½	¾	6.00	4.50
2	½	7.00	5.00
2½	¾	9.00	7.00
3	¾	11.00	8.00
3½	1	15.00	11.00
4	1¼	18.00	14.00
5	1½	28.00	22.00
6	1½	42.00	38.00
8	2	100.00	85.00

Chime Whistles can only be furnished with Pipe Connection as listed above.

Always order Whistles by the diameter of Bell, and not by the size of Pipe Connection.

Special Whistles made to order for Air Pressures below 25 pounds. Prices on application.

## DAMPER REGULATORS WITH METAL DIAPHRAGM



TYPE B-C  
TYPE D

Price, Type B-C, 7 inch Diameter . . . . .	Each	20.00
Price, Type D, 10 inch Diameter . . . . .	Each	27.00

These Regulators are equipped with metal diaphragm.

Price includes two ceiling pulleys and 12 feet of chain for the Type B-C Regulator and two bell cranks with brackets and 12 feet of chain for the Type D Regulator.

The Type B-C Regulator is suitable for use on medium and large size house-heating boilers for pressure or vapor systems.

The Type D Regulator is suitable for use on vapor systems only and is recommended where a more powerful regulator is required.

# FUSIBLE PLUGS



**REGULAR LENGTH**

No. 750, FOR OUTSIDE  
INSERTION

No. 751, FOR INSIDE  
INSERTION



No. 752, FOR OUTSIDE  
INSERTION

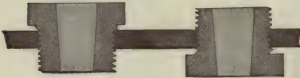


**EXTRA LONG**

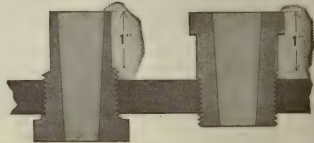
No. 753, FOR INSIDE  
INSERTION

## INSIDE OR PRESSURE SIDE

No. 751,  
INSIDE TYPE



No. 750,  
OUTSIDE TYPE



No. 752,  
OUTSIDE TYPE

No. 753,  
INSIDE TYPE

## OUTSIDE OR FIRE SIDE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 750 and No. 751.....Each	.60	.75	1.00	1.50	2.00	3.00
No. 752 and No. 753.....Each	1.20	1.50	2.00	3.00	4.00	6.00

Our Fusible Plugs are filled with BANCA TIN.

### RECOMMENDATIONS

Nos. 750 and 751 for ordinary service.

Nos. 752 and 753 to comply with the latest rules issued by the Steamboat Inspection Service of the United States Government.

Nos. 752 and 753 to comply with the various State and City Laws requiring Fusible Plugs with extensions.

Plugs should be installed in direct passage of the fire or gases with small end of the Banca Tin exposed to the fire or gases. These Plugs are NOT to be used inside a steam drum, etc., where the temperature of the steam is used as a fusing agent.

### STAMPING

Nos. 750 and 751 are stamped as shown.

Nos. 752 and 753 are stamped as shown and in addition have the heat number stamped in compliance with the Steamboat Inspection Service of the United States Government.

### CONSTRUCTION

The No. 750 is made regular length and constructed for outside insertion. The No. 751 is made regular length and constructed for inside insertion. The No. 752 is made extra long (having an extension one inch beyond the thread) and constructed for outside insertion only. The No. 753 is made extra long and constructed for inside insertion only. We can furnish these to order any length desired, at special prices according to quantity wanted.

### ORDERING

In ordering, always give style, number and size.

When not otherwise specified, the outside type will be furnished as follows:

No. 750—For ordinary service.

No. 752—For the Steamboat Inspection Service of the United States Government and for some State and City Laws.

## GREASE CUPS

## SCREW FEED AND AUTOMATIC



No. 668  
SCREW FEED



No. 670  
AUTOMATIC FEED

## No. 668. SCREW FEED, FINISHED BRASS

Number.....	00	0	1	2	3	4
Capacity (Grease).....Ounces	$\frac{3}{8}$	1	$1\frac{1}{2}$	3	6	10
Shank, Iron Pipe Thread.....	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Extreme Outside Diameter.....Inches	$1\frac{7}{16}$	$1\frac{3}{4}$	2	$2\frac{3}{16}$	$3\frac{3}{16}$	$3\frac{1}{2}$
No. 668.....Each	1.00	1.20	1.60	2.00	2.80	4.00

## No. 670. AUTOMATIC FEED, FINISHED BRASS

Diameter of Body.....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Capacity (Grease).....Ounces	1	$1\frac{1}{2}$	3	$4\frac{1}{2}$	$6\frac{1}{2}$
Shank, Iron Pipe Thread.....	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
No. 670.....Each	2.00	2.50	3.20	4.30	6.00



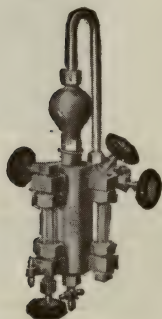
No. 672

## PLAIN GREASE CUPS

## No. 672

Diameter of Body...Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Capacity (Grease)..Ounces	$\frac{3}{8}$	1	2	$3\frac{1}{2}$
Shank, Iron Pipe Thread..	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 672.....Each	.90	1.15	1.50	2.15

# IMPROVED STANDARD DETROIT SIGHT-FEED LUBRICATORS FOR STATIONARY ENGINES



STYLE C

IMPROVED STANDARD  
SINGLE CONNECTION



IMPROVED STANDARD  
DOUBLE CONNECTION

## PRICE, SINGLE CONNECTION

Size .....	$\frac{1}{4}$ Pint	$\frac{1}{2}$ Pint	$\frac{1}{2}$ Pint
Brass Finish ..... Each	15.00	17.00	20.00
Nickel Plated ..... Each	18.00	20.00	23.00

Size of glass, sight feed,  $\frac{3}{4} \times 2\frac{1}{8}$  inch.

## PRICE, DOUBLE CONNECTION

Size.....	$\frac{1}{2}$ Pint	$\frac{1}{2}$ Pint	1 Pint	1 Quart	$\frac{1}{2}$ Gallon	1 Gallon
For Cylinder ..	10 inch and under	10 to 12 inch	12 to 18 inch	18 to 30 inch	30 inch and over	
Brass Finish... Each	17.00	22.00	30.00	45.00	60.00	75.00
Nickel Plated .. Each	20.00	25.00	35.00	50.00	65.00	80.00

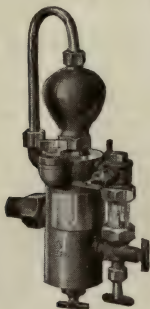
## SIZE OF GLASSES USED

Sight Feed .....	$\frac{5}{8} \times 2\frac{1}{8}$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 3\frac{1}{4}$
Gauge.....	$\frac{5}{8} \times 2\frac{1}{8}$	$\frac{5}{8} \times 3\frac{1}{4}$	$\frac{5}{8} \times 4\frac{3}{8}$	$\frac{5}{8} \times 4\frac{3}{8}$	$\frac{3}{4} \times 6$	$\frac{3}{4} \times 7\frac{3}{4}$
Sight Feed and Gauge Glasses.....	Each, Net					.10

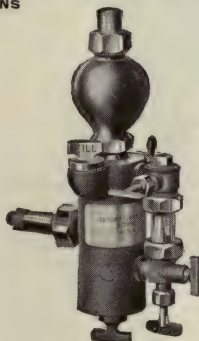


## ZERO SIGHT FEED LUBRICATORS SINGLE OR DOUBLE CONNECTION

ESPECIALLY ADAPTED FOR STEAM ENGINES AND PUMPS LOCATED IN COLD OR  
EXPOSED POSITIONS



SINGLE CONNECTION



DOUBLE CONNECTION

### PRICE LIST—SINGLE CONNECTION

Size.....	$\frac{1}{4}$ Pint	$\frac{1}{2}$ Pint	$\frac{3}{4}$ Pint	1 Pint	1 Quart
Bronzed Body, Finished Trimmings. Each	15.00	17.00	20.00	28.00	42.00
Nickel Plated all over.....Each	18.00	20.00	23.00	32.00	47.00
Pipe Thread on Support Arm .....Inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

### PRICE LIST—DOUBLE CONNECTION

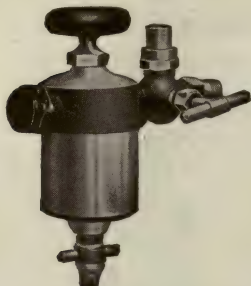
Size.....	$\frac{1}{4}$ Pint	$\frac{1}{2}$ Pint	$\frac{3}{4}$ Pint	1 Pint	1 Quart
Bronzed Body, Finished Trimmings. Each	15.00	17.00	20.00	28.00	42.00
Nickel Plated all over.....Each	18.00	20.00	23.00	32.00	47.00
Pipe Thread on Support Arm.....Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$

**THE ZERO LUBRICATOR** possesses every feature necessary or desirable for traction engine service, or for engines working in exposed places, subject to sudden changes of temperature. It is also used quite extensively on steam pumps.

**THE HEATING FEATURE.** The oil in the Zero Cup is kept warm by steam. This heating arrangement is automatic; it requires no attention—gives no trouble—but no matter how cold the weather, the oil will continue warm while steam is supplied to the engine. The oil can not chill in this cup while the boiler is producing steam.

**THE SINGLE CONNECTION LUBRICATOR** may be attached to the steam pipe on either side of the throttle, or to the steam chest direct, by using an elbow and a short piece of pipe.

When ordering repair parts, it is absolutely necessary to state the size of Lubricator and the shop number, which is stamped on the body.



**SWIFT  
SIGHT FEED  
LUBRICATORS**

**DOUBLE CONNECTION**

**CLASS F**

Capacity .....	$\frac{1}{4}$ Pint	$\frac{3}{8}$ Pint	$\frac{1}{2}$ Pint	1 Pint	$1\frac{1}{2}$ Pint	1 Quart
Brass Finish .....Each	2.75	3.00	3.25	4.65	5.40	6.15
Nickel Plated .....Each	3.15	3.40	3.65	5.30	6.05	6.80
Pipe Thread .....Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

**SINGLE CONNECTION**



**CLASS F. S. C.**



**CLASS G.**

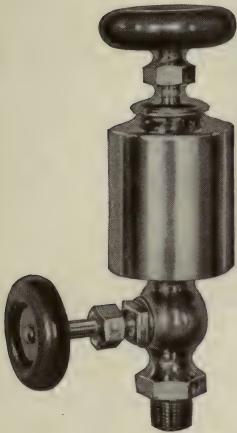
**CLASS F. S. C.**

Capacity.....	$\frac{1}{4}$ Pint	$\frac{3}{8}$ Pint	$\frac{1}{2}$ Pint	1 Pint	$1\frac{1}{2}$ Pint	1 Quart
Brass Finish .....Each	3.50	3.75	4.00	6.00	6.75	7.50
Nickel Plated .....Each	3.90	4.15	4.40	6.65	7.40	8.15
Pipe Thread .....Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

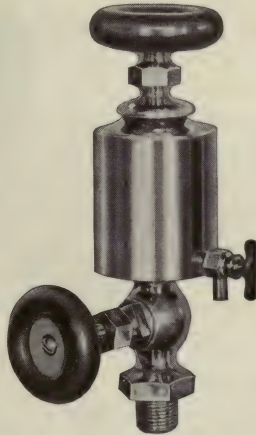
**CLASS G.**

Capacity .....	$\frac{1}{4}$ Pint	$\frac{3}{8}$ Pint	$\frac{1}{2}$ Pint
Brass Finish .....Each	2.15	2.50	2.90
Nickel Plated .....Each	2.50	2.85	3.25
Pipe Thread.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$

## ENGINE LUBRICATORS



No. 680



No. 682

WITH AIR COCK AND TUBE

Diameter of Body.....Inches	1	1¼	1½	1¾	2
Shank, Iron Pipe Thread.....	¼	⅜	⅜	½	½
No. 680.....Each	2.00	2.20	2.40	2.60	2.90
No. 682, with Air Cock and Tube..Each		3.20	3.40	3.60	3.90
Diameter of Body.....Inches	2¼	2½	3	3½	4
Shank, Iron Pipe Thread.....	½	½	¾	¾	¾
No. 680.....Each	3.25	3.75	4.75	7.00	10.00
No. 682, with Air Cock and Tube..Each	4.25	4.75	5.75	8.00	11.00

The No. 682 Lubricator is so constructed that the flow of oil is regulated by condensation (it feeds as it condenses), which is a very important feature.

The result of this slow feed is that it takes hours for the oil to pass through, instead of it running out in a short time.

We would therefore recommend consumers to use the Lubricator with Air Cock and Tube.

## TO OPERATE

Fill with oil to top of inside tube and open valve when you commence to run. When the oil is exhausted open cock and let water out, then fill with oil again as before.

## OIL CUPS



No. 650 PLAIN

Diameter of Body . . . . . Inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Shank, Iron Pipe Thread . . . . .	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 650, Plain . . . . . Each	.30	.35	.40	.50	.60	.90
Diameter of Body . . . . . Inches	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	
Shank, Iron Pipe Thread . . . . .	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	
No. 650, Plain . . . . . Each	1.25	1.75	2.25	2.75	4.00	



No. 652 HINGED LID

Diameter of Body . . . . . Inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Shank, Iron Pipe Thread . . . . .	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 652, Hinged Lid . . . . . Each			1.00		1.40	1.85
Diameter of Body . . . . . Inches	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	
Shank, Iron Pipe Thread . . . . .	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	
No. 652, Hinged Lid . . . . . Each		3.10				

## BOILER TUBE EXPANDERS



**ROLLER**

Size of Tube, Outside. Inches	1	1¼	1½	1¾	1⅞	2	2¼	2½	2¾
Price..... Each	10.00	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
Size of Tube, Outside. Inches	3	3¼	3½	3¾	4	4¼	4½	5	6
Price..... Each	18.00	20.00	23.00	25.00	30.00	35.00	40.00	50.00	60.00



**SPRING**

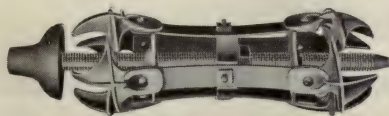
Size of Tube, Outside. . . . Inches	1	1¼	1½	1¾	2	2¼	2½	2¾	
Price..... Each	11.00	11.00	11.00	11.00	12.00	13.00	15.00	18.00	
Size of Tube, Outside. . . . Inches	3	3¼	3½	4	4½	5	6		
Price..... Each	22.00	26.00	30.00	33.00	37.00	42.00	60.00		

## BOILER TUBE SCRAPERS



**THE BUFFALO DUPLEX**

Outside Diameter of Tube . . . . Inches	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price..... Each	2.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00



**THE ENGINEERS' FAVORITE**

Outside Diameter of Tube . . . . Inches	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Price..... Each	2.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00



## GAS PLYERS



**BURNER PLYERS**  
**TWO HOLES. 7 INCH**



**GAS PLYERS**  
**7 TO 14 INCH**



**BURNER PLYERS**  
**ONE HOLE. 5 AND 6 INCH**

Size.....Inches	5	6	7	8	9	10	12	14
Polished. ....Per dozen			7.40	8.25	9.25	10.70	13.00	17.00
Burner Pliers, Polished...Per dozen	6.50	6.50	10.00					

## COMBINATION PLYERS



**GAS PLYERS, WIRE CUTTERS, WRENCH AND SCREW DRIVER COMBINED**

Size.....Inches	6	8	10
Price, Black. ....Per dozen	13.50	16.00	18.00
Price, Plated. ....Per dozen	15.00	18.00	21.00

## GAS FITTERS' AUGERS



Size of Pipe. Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Size of Auger...Inches	5/8	3/4	7/8	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Price.....Each	1.25	1.50	1.75	2.50	3.00	3.50	4.00	5.00	6.00

In ordering Augers, state pipe size.

## TRIMO PIPE WRENCHES



Length open. .Inches	6	8	10	14	18	24	36	48
Adjustable to sizes	$\frac{1}{4}$ inch wire to $\frac{1}{2}$ inch pipe	$\frac{1}{4}$ inch wire to $\frac{3}{4}$ inch pipe	$\frac{1}{4}$ inch wire to 1 inch pipe	$\frac{1}{4}$ inch wire to 1 $\frac{1}{2}$ in. pipe	$\frac{1}{4}$ inch wire to 2 inch pipe	$\frac{1}{4}$ inch wire to 2 $\frac{1}{2}$ in. pipe	$\frac{1}{2}$ inch pipe to 3 $\frac{1}{2}$ in. pipe	1 inch pipe to 5 inch pipe
Price.....Each	2.00	2.25	2.50	3.50	5.00	7.25	13.50	20.00
Jaws.....Each	.75	.80	.85	1.15	1.75	2.25	4.35	7.50
Nuts.....Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Inserted Jaws..Each	.35	.40	.50	.60	.70	.80	1.10	2.00
Frames.....Each	.38	.42	.50	.60	.75	.95	1.70	2.20
Springs.....Each	.03	.03	.03	.03	.04	.04	.04	.04
Frame Pins...Each	.03	.03	.04	.04	.04	.04	.05	.05
Jaw Pins.....Each	.03	.03	.04	.04	.04	.04	.05	.05

In ordering parts, state the size of Wrench.

## KNIFE HANDLE WRENCHES



Size.....Inches	6	8	10	12	15	18	21
Black, Price.....Per dozen	10.00	12.00	14.00	18.00	24.00	32.00	39.00

## BROWN'S ADJUSTABLE PIPE TONGS



Number.....	1	1 $\frac{1}{2}$	2
Holds Pipe.....Inches	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{1}{2}$ to 1 $\frac{1}{4}$
Price.....Each	.60	.75	.85
Number.....	3	4	5
Holds Pipe.....Inches	1 to 2	1 $\frac{1}{2}$ to 3	2 $\frac{1}{2}$ to 4
Price.....Each	1.20	2.70	6.00

STILLSON'S  
PIPE WRENCHES

PIPE IS NOT CRUSHED BY ITS USE



Length, open . . . . Inches	6	8	10	14	18	24	36	48
For Sizes Pipe . . . Inches	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to $2\frac{1}{2}$	$\frac{1}{4}$ to $3\frac{1}{2}$	1 to 5
Price . . . . . Each	2.00	2.25	2.50	3.50	5.00	7.25	13.50	20.00
Extra Frames . . . . Each	.38	.42	.50	.60	.75	.95	1.70	2.20
Extra Nuts . . . . . Each	.12	.15	.20	.30	.35	.55	1.10	1.50
Extra Jaws . . . . . Each	.75	.80	.85	1.15	1.75	2.25	4.35	7.50

Unless otherwise specified, wrenches 10 inch and larger will always be furnished with steel handles.

PARMELEE  
PIPE WRENCHES

ESPECIALLY ADAPTED FOR HANDLING BRASS PIPE, SMOOTH RODS OR  
NICKEL PLATED TUBING



STYLE No. 1

Size Number of Set	Price per Set Complete	For Sizes of Pipe Inches	Length of Handle Inches	Extra Handles Price Each	Extra Girths Price for Each Size
No. 10	5.00	$\frac{3}{8}$ to 1	10	2.25	$\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , 1 . . . .75
No. 20	7.50	1 to 2	20	3.00	1, $1\frac{1}{4}$ . . . . .1.00 $1\frac{1}{2}$ , 2 . . . . .1.25
No. 30	9.50	2 to 3	25	5.00	2, $2\frac{1}{2}$ , 3 . . . . .1.50
No. 40	13.00	3 and 4		7.50	3 . . . . .2.50 4 . . . . .3.00

Positive grip; no lost motion; has no teeth, and will not mar the pipe or threads; will not slip on oily, galvanized or polished pipe.  
Makes or breaks the tightest joint, easily.  
Can be operated in close quarters and where space between pipes is limited.

## SAUNDERS' PIPE CUTTERS



Number.....	1	2	3	4
Cuts Pipe from.....Inches	$\frac{1}{8}$ to 1	1 to 2	2 to 3	$2\frac{1}{2}$ to 4
Price, Complete.....Each	3.00	4.50	11.00	18.00
Price, Extra Wheels.....Each	.24	.32	.60	.60
Price, Extra Rollers.....Each	.24	.32	.50	.50
Price, Extra Pins.....Each	.10	.10	.15	.15
Price, Extra Blocks and Wheels...Each	1.25	1.75	2.75	3.50

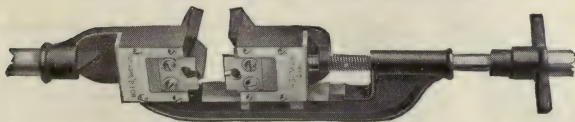
## BARNES' THREE-WHEEL PIPE CUTTERS



Number.....	1	2	3	4	5
Cuts Pipe from.....Inches	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	4 to 6
Price.....Each	4.50	6.00	10.00	20.00	30.00
Extra Cutter Wheels.....Each	.25	.30	.40	.50	.75
Extra Wheel Pins.....Each	.10	.10	.10	.15	.15
Extra Handles.....Each	1.00	1.25	2.25	4.50	7.00

Larger sizes furnished. Prices on application.

## BEAVER SQUARE END PIPE CUTTER



Number.....	1	5	10	15
Cuts Pipe from.....Inches	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$2\frac{1}{2}$ to 4	$2\frac{1}{2}$ to 6
Price.....Each	18.00	20.00	90.00	180.00
Extra Sets of Knives.....	1.20	1.50	2.50	5.00
Regrinding Knives.....	.30	.40	.70	1.40

The price given above includes two sets of extra knives.

COMMON CHAIN PIPE TONGS



Number.....	2	3	4	5	6	7
For Sizes Pipe. ....Inches	1 to 2	1¼ to 4	2 to 6	2½ to 8	4 to 10	4 to 16
Length of Lever.....Feet	2¾	3	4	5	6	7
Average Weight.. Pounds	7	12	24	33	50	100
Price.....Each	5.50	6.25	9.00	12.50	16.00	30.00

UNIVERSAL CHAIN PIPE TONGS



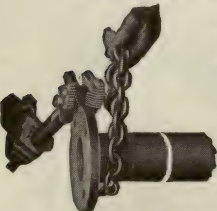
WITH FLAT OR CABLE LINK CHAIN  
Flat Link Chains will be furnished unless Cable are specified.

Number.....	10	11	12	13	13½	14	15
For Sizes Pipe. ....Inches	⅝ to ¾	⅝ to 1½	¾ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12
Length. ....Inches	13¾	20	27	37	44½	50½	64½
Weight. ....Pounds	1¾	5¾	10	16	24	31	50
Price.....Each	2.50	3.50	5.00	7.00	9.00	11.00	18.00
Extra Flat or Cable Chain. Ea.	.75	1.00	1.50	2.50	3.50	4.50	7.50
Extra Jaws. ....Per pair	1.00	1.75	2.75	4.00	4.75	5.50	7.50

IDEAL CHAIN WRENCH



Can be furnished with flat link chain at 15 per cent. higher price.



Number.....	2	3	4	5
For Sizes Pipe. .Inches	½ to 3½	1 to 5	2 to 8	2½ to 12
Length ..Inches	27	38	49	61
Weight. Pounds	10	18	28	50
Price.....Each	6.00	8.00	11.00	16.00
Extra Jaws...Per pair	3.25	4.50	5.85	7.50
Extra Handle....Each	2.10	3.25	4.75	6.90
Extra Chain....Each	.95	1.20	1.70	3.00

The Ideal Chain Wrench will handle ordinary pipe work as well as any other and owing to the shape of the Jaws, will be found particularly adapted for use with Fittings and Flanges.



## PIPE TAPS



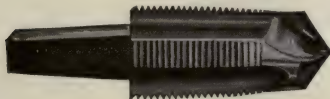
Size .....	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price .....	Each	1.12	1.25	1.50	1.87	2.50	3.12
Threads.....	Per inch	27	18	18	14	14	11½
Size .....	Inches	1¼	1½	2	2½	3	
Price .....	Each	3.75	4.62	6.25	10.50	15.00	
Threads.....	Per inch	11½	11½	11½	8	8	

## PIPE REAMERS



Size.....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price.....	Each	1.25	1.50	1.87	2.50	3.12
Size.....	Inches	1¼	1½	2	2½	3
Price.....	Each	3.75	4.62	6.25	10.50	15.00

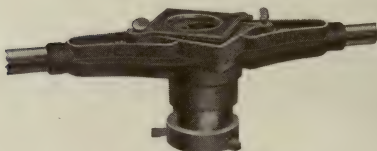
## COMBINED DRILL, REAMER AND TAP



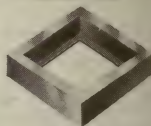
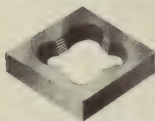
Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1¼	1½	2
Price.....	Each	2.50	2.50	3.00	4.50	6.00	7.25	8.50	10.75

# STOCKS AND DIES

**MALLEABLE STOCK**
**SOLID DIES**

**B, C, DD AND D STOCKS**

**E AND H STOCKS, WITH LEADER SCREW**

Size.....	B	C	DD	D	E	H
Dies Furnished with each Stock. Ins.	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{4}$ to 1	$\frac{3}{4}$ to $1\frac{1}{4}$	1 to $1\frac{1}{2}$	$1\frac{1}{4}$ to 2	$2\frac{1}{2}$ & 3
Dimensions of Dies. Inches	$2 \times \frac{1}{2}$	$2\frac{1}{2} \times \frac{3}{4}$	$3 \times \frac{3}{4}$	$3 \times \frac{3}{4}$	$4 \times \frac{1}{8}$	$5 \times 1\frac{1}{4}$
Stock with Dies, Complete.. Each	9.50	15.00	13.50	13.50	20.00	43.00
Stock without Dies.. Each	3.50	5.00	6.00	6.00	9.50	25.00



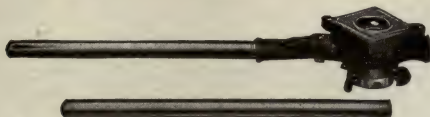
Size.....	B	C	DD	D	E	H
Pipe Sizes.....	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to 1	$\frac{3}{8}$ to $1\frac{1}{4}$	$\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ & 2	$2\frac{1}{2}$ & 3
Extra Dies, Right or Left Hand. Each	1.50	2.00	2.50	2.50	3.50	9.00
Extra Bushings..... Each	.25	.35	.45	.45	.60	1.00

## EXTRA PARTS

Size.....	B	C	DD	D	E	H
Caps..... Net, Each	.15	.20	.30	.30	.30	
Thumb Screws for Cap or Bushing. Net, Each	.10	.10	.10	.10	.10	
Machine Screws for Cap... Net, Each	.05	.05	.05	.05	.05	
Handles..... Net, Per Set	.50	.70	.80	.80	1.00	
Die Frames.... Net, Each			.12	.12	.20	.60
Leader Screws.. Net, Each					.75	
Thumb Screws for Leader. Net, Each					.10	

The above Stocks and Dies are made so that they are interchangeable with those of eastern manufacture, known to the trade as No. 0, No. 1, No.  $1\frac{1}{2}$ , No.  $1\frac{3}{4}$  and No. 2, respectively.

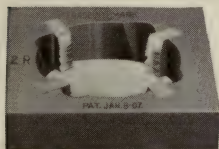
## RATCHET DIE STOCKS



### PRICE LIST AND DIMENSIONS

Number .....	A	B	C	D	E
Dies Furnished with Each Stock	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	1 to $1\frac{1}{2}$	$1\frac{1}{4}$ to 2	$2\frac{1}{2}$ to 3
Dimensions of Dies .....	$2 \times \frac{1}{2}$	$2\frac{1}{2} \times \frac{3}{4}$	$3 \times \frac{3}{4}$	$4 \times \frac{7}{8}$	$5 \times 1\frac{1}{4}$
Stock, with R. H. Dies, Complete .....	14.50	15.00	18.50	20.00	44.50
Stock, without Dies or Guides... Each	7.50	7.50	13.00	12.50	29.00
Extra Dies, R. or L. Hand. Each	1.40	1.50	1.80	2.50	7.75
Guides .....	.25	.25	.35	.45	.85
Die Frames .....		.22	.30	.38	.45
Space Required around Pipe to Cut and Thread .....	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5

The C, D and E Stocks have Leader Screws.



## SKIP TOOTH DIE

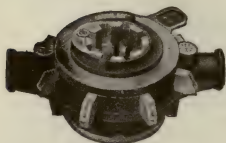
Size .....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Block $2 \times 2 \times \frac{1}{2}$ ... Each	2.00	2.50	2.50	3.00							
Block $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4}$ ... Each	2.00	2.50	2.50	3.00	3.00	3.50					
Block $3 \times 3 \times \frac{3}{4}$ ... Each	2.50	3.00	3.00	3.50	3.50	4.00	4.00	4.50			
Block $4 \times 4 \times \frac{7}{8}$ ... Each				4.00	4.00	4.50	4.50	5.00	5.00		
Block $5 \times 5 \times 1\frac{1}{4}$ ... Each										13.00	14.00



## KNURLED CUTTER WHEEL

FOR BARNES		FOR SAUNDERS		FOR TRIMO	
Number	Each	Number	Each	Number	Each
1	.50	1	.50	1	.60
2	.60	2	.60	2	.60
3	.80	3	1.10	3	.90
4	1.00	4	1.10		
5	1.10	5	1.10		

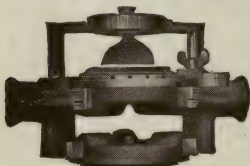
## BEAVER DIE STOCKS



**No. 6**  
**1/4 TO 3/4 INCH**

The No. 6 "Beaverette" threads all sizes from 1/4 to 3/4 inch, inclusive, without changing dies. The two sets of dies necessary for the two thread pitches are operated by one handle.

Price, Complete.....	15.00
Extra Dies, 1/8, 1/4-3/8, or 1/2-3/4.....Each	3.00

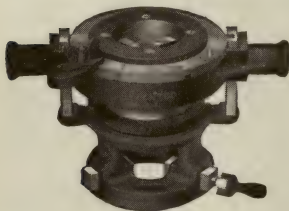


**No. 210**  
**1/2 TO 1 1/4 INCH**

The No. 210 is a cross bar receding die stock without a leader screw and cuts either right or left threads.

Price, Complete.....	20.00
Extra Dies, Double End, R. or L.....	5.00
Extra Dies, Single End, R. or L.....	3.50

Extra Dies threading 1/4-3/8 can be furnished.



**No. 25**  
**1 TO 2 INCH**

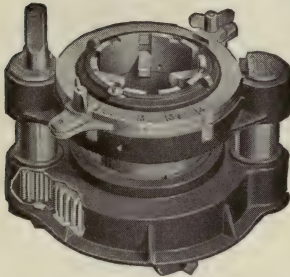
The No. 25 cuts all threads from 1 to 2 inches without changing dies. It is adjustable and can be set by a simple movement of the handle. It is equipped with a universal chuck which centers all sizes of pipe.

Price, Complete.....	30.00
Extra Dies R. H. only.....	3.50

The No. 26 is similar to the No. 25 in construction but is fitted with a ratchet attachment. It may also be used as a plain stock.

No. 26, Complete.....	35.00
Extra Dies, R. H. only.....	3.50

## BEAVER DIE STOCKS



**No. 41**  
**2½ TO 4 INCH**

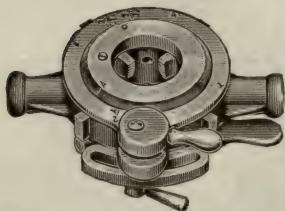
These Die Stocks are fitted with a gear by reason of which one man can thread any size pipe within the range of the stock. They are constructed of malleable iron and have bronze bushed, cut steel gears. They are light, strong, and durable.

Number.....	41	61	80	90
Cuts Pipe.....Inches	2½ to 4	2½ to 6	4½ to 8	9 to 12
Price, Complete.....	110.00	220.00	300.00	500.00
Extra Dies, Complete Set.....	9.00	14.00	20.00	30.00

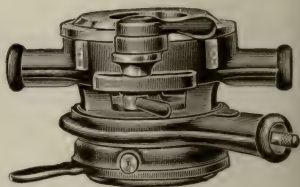
The No. 41 Stock has only one set of dies, the Nos. 61, 80, 90 require two sets to cover their range.



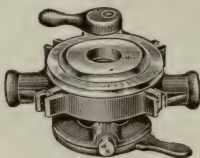
## OSTER BULL DOG DIE STOCKS



**REGULAR STOCK**  
Nos. 101 TO 104½



**RATCHET STOCK**  
Nos. 102 R TO 105½ R



**THE 82 STOCK**

This line of stocks has self-locking and adjustable dies. By moving the top handle to the right as far as it will go, the dies are set and held in place while cutting.

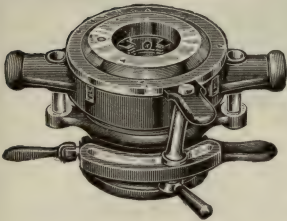
ONE MOVEMENT OF THE HANDLE WILL OPEN OR CLOSE THE DIES. NO RESETTING OR BACKING OFF THE THREADS.

The tool is equipped with self-locking and centering guides. These guides are operated on a scroll and can be set to all sizes the tool will thread. The more pressure on the end of the guides, the more solid the locking arrangement.

RANGE OF SIZES OF PIPE				REGULAR STOCKS		RATCHET STOCKS		EXTRA DIES	SHIPPING WT. COMPLETE	
One Set	One Set	One Set	One Set	Catalogue No.	List Price Compl'te	Catalogue Number	List Price Compl'te	Per Set (4 pcs.)	Plain	Ratchet
			¼ to ¾	82	13.00			3.00	10 lbs.	
⅛	¼ & ⅜	½ & ¾		101	13.00			1.50	11 lbs.	
¼ & ⅜	½ & ¾	1 & 1¼		102	17.00	102 R	20.00	1.75	20 lbs.	24 lbs.
1 & 1¼	1½ & 2			103	22.00	103 R	27.00	2.00	27 lbs.	34 lbs.
½ & ¾	1 & 1¼	1½ & 2		104	25.00	104 R	30.00	2.00	29 lbs.	35 lbs.
¼ & ⅜	½ & ¾	1 & 1¼	1½ & 2	104½	28.00			2.00	30 lbs.	
1½ & 2	2½ & 3			105	40.00	105 R	50.00	3.00	62 lbs.	70 lbs.
1 & 1¼	1½ & 2	2½ & 3		105½	43.00	105½ R	53.00	3.00	65 lbs.	73 lbs.
2½ & 3	3½ & 4			107	55.00	107 R	60.00	3.50	94 lbs.	138 lbs.
1½ & 2	2½ & 3	3½ & 4		107½	58.50	107½ R	63.50	3.50	98 lbs.	142 lbs.
	2½ & 3	3½ & 4	4½ & 5			108 R	75.00	5.00		137 lbs.
1½ & 2	2½ & 3	3½ & 4	4½ & 5			108½ R	80.00	5.00		140 lbs.

Nos. 105 to 107½, operated with four handles. Nos. 107R to 108½R, operated with four handles or two handles as a ratchet stock. All tools supplied with dies and handles complete at above list prices.

OSTER MATCHLESS DIE STOCKS



A self contained easy pipe threader without any loose dies, loose bushings, or set screws.

These stocks are equipped with narrow easy cutting dies, one set dies for all sizes 1 to 2 inch pipe.

Dies and Guides easily adjusted by a small lever handle.

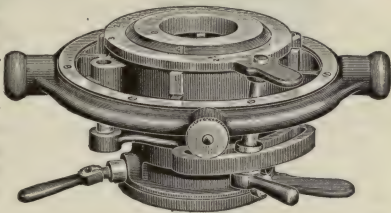
The pipe is centered in the dies by the adjustable guides and these are locked on the pipe by a wing nut.

The leader screw is covered by a patented clip shield to keep the chips and dirt out of the threads.

The Matchless Ratchet Die Stock has an exclusive feature (patented), to prevent back-lash. The thread is started with one hand, and every inch of the forward stroke held. This improvement prevents the stock from turning back while operating the ratchet on even the lightest cut, or at the very beginning of the thread.

It makes a practical tool for close quarters. The stock can be used with or without the ratchet; with two handles as a regular or plain stock, or with one handle as a ratchet tool.

RATCHET PATTERN

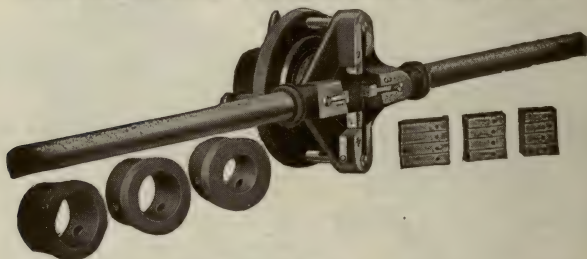


TOP VIEW

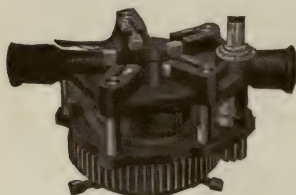
WILL SWING IN 14 INCH CIRCLE, CAN  
THREAD PIPE 5 INCHES FROM WALL

Catalogue No.	Sets of Dies	List Price	Extra Dies	Shipping Weight
1B 1½ inch to ¾ inch.....	2	14.50	1.50	11 lbs.
3B 1 inch to 2 inch.....	1	30.00	2.00	25 lbs.
3BR (Ratchet) 1 inch to 2 inch.....	1	35.00	2.00	36 lbs.
4BR (Ratchet) 2½ inch to 4 inch.....	2	80.00	5.00	120 lbs.

## TOLEDO ADJUSTABLE THREADING DEVICES

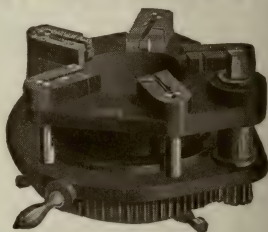


**DEVICE No. 1 THREADS PIPE FROM 1 TO 2 INCH INCLUSIVE**



**GEARED DEVICE No. 2**

THREADS PIPE FROM  $2\frac{1}{2}$  TO  
4 INCH INCLUSIVE



**GEARED DEVICE No. 3**

THREADS PIPE FROM  $4\frac{1}{2}$  TO  
8 INCH INCLUSIVE

**DEVICE No. 1. COMPLETE, INCLUDING DIES, PRICE, \$24.00**

Extra Dies for No. 1.

1	Inch, per Set of Four Pieces.....	\$2.50
$1\frac{1}{4}$	" " " " " " " " .....	2.50
$1\frac{1}{2}$	" " " " " " " " .....	2.50
2	" " " " " " " " .....	2.50

**DEVICE No. 2. COMPLETE, INCLUDING DIES, PRICE, \$100.00**

Extra Dies for No. 2

$2\frac{1}{2}$	Inch, per Set of Five Pieces.....	\$8.00
3	" " " " " " " " .....	8.00
$3\frac{1}{2}$	" " " " " " " " .....	8.00
4	" " " " " " " " .....	8.00

No. 2 Machine weighs 60 pounds.

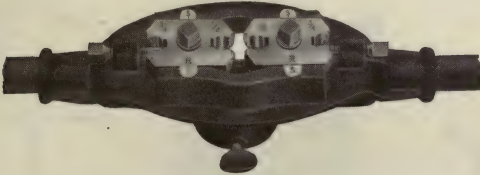
**DEVICE No. 3. COMPLETE, INCLUDING DIES, PRICE, \$300.00**

Extra Dies for No. 3

$4\frac{1}{2}$	Inch, per Set of Five Pieces.....	\$12.00
5	" " " " " " " " .....	12.00
6	" " " " " " " " .....	12.00
7	" " " " " " " " .....	12.00
8	" " " " " " " " .....	12.00

No. 3 Machine weighs 155 pounds.

# ARMSTRONG ADJUSTABLE DIE STOCKS



SIZE NUMBER	Threads Pipe	PRICE LIST				
		Stock and Dies Com- plete	Stock Only	Extra Dies Per Set	Extra Bush- ings Each	Extra Wrench- es Each
No. 1, 4 Sets of Dies (8 Pieces) Single End	$\frac{1}{8}$ to $\frac{1}{2}$	9.00	3.25	1.25	.20	.25
No. 2, 5 Sets of Dies (10 Pieces) Single End	$\frac{1}{4}$ to 1	12.00	4.00	1.50	.25	.25
No. 2½, 2 Sets of Dies (4 Pieces) Double Ends	$\frac{1}{2}$ to $1\frac{1}{4}$	12.00	4.50	3.25	.40	.25
No. 3, 3 Sets of Dies (6 Pieces) Single End	$1\frac{1}{4}$ to 2	20.00	7.00	4.00	.50	.50
No. 6, 1 Set of Dies (2 Pieces) Double Ends	$2\frac{1}{2}$ to 3	40.00	25.00	15.00	1.00	.50
No. 7, 2 Sets of Dies (8 Pieces) Double Ends	$2\frac{1}{2}$ to 4	60.00	30.00	16.00	1.50	.75

## WHEN ORDERS ARE SO SPECIFIED

The No. 2 Complete Stock will be furnished, in addition, with  $\frac{1}{8}$  inch Die and Bushing by adding to the above List Price \$1.75.

The No. 2½ Complete Stock will be furnished, in addition, with  $\frac{1}{4}$  and  $\frac{3}{8}$  inch Single End Dies and Bushings by adding to the above List Price \$2.50 for each Die and 40 Cents for each Bushing, or \$5.80 for the two pipe sizes.

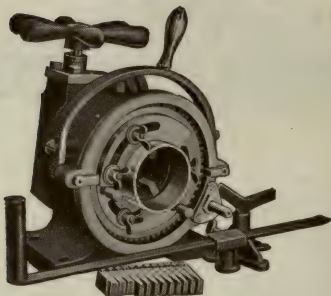
The No. 3 Complete Stock will be furnished, in addition, with  $\frac{3}{4}$  and 1 inch Dies and Bushings by adding \$9.00 to the above List Price.

Prices for Extra Dies in all sizes are per set of two pieces. Nos. 1, 2 and 3 Stocks have Single End Dies, requiring one set of two pieces to thread one size of pipe. No. 2½ and No. 6 Stocks have Double End Dies in which two pieces also comprise one set, but each set threads two sizes of pipe. When  $\frac{1}{4}$  and  $\frac{3}{8}$  inch Dies are added to No. 2½ Stock, Single End Dies will be furnished. In the No. 7 Stock, the price for one set of Dies comprises four pieces, and each set will thread two sizes of pipe, viz.,  $2\frac{1}{2}$  and 3 inch and  $3\frac{1}{2}$  and 4 inch. Nos. 6 and 7 Stocks have four arms.

Left Hand Dies will be furnished at same prices as Right Hand Dies.

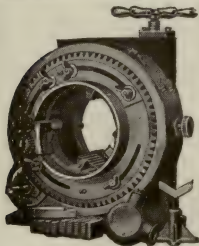
# FORBES PATENT DIE STOCKS

FOR HAND POWER



No. 30

Number	Range	Net Weight	Price
*30	¼ to 2 Inches, Both Right and Left.....	155	50.00
*32	¼ to 2 Inches, for Solid Dies (without Dies).....	140	45.00
*34	1 to 3 Inches, R. H., 1 to 2 Inches L. H.....	185	75.00
*36	¾ to 3 Inches, R. H., ¾ to 2 Inches L. H.....	190	85.00
*37	¼ to 3 Inches, R. and L.....	200	105.00
†46	2½ to 4 Inches, R. H.....	237	85.00
*38	1½ to 4 Inches, R. H.....	251	100.00
*40	1½ to 4 Inches, R. and L.....	257	115.00
*42	1 to 4 Inches, R. H.....	253	110.00
*44	1 to 4 Inches, R. and L.....	260	130.00
†50	4 to 6 Inches, R. H.....	341	115.00
†52	3½ to 6 Inches, R. H.....	341	130.00
†54	2½ to 5 Inches, R. H.....	343	150.00



Number	Range	Weight	Price
†56	2½ to 6 Inches, R. H...	345	175.00
†62	2½ to 6 Ins., R. H., Extra Heavy.	815	300.00
*58	1 to 6 Inches, R. H.....	384	190.00
*60	1 to 6 Inches, R. and L..	404	235.00
†64	2½ to 8 inches, R. H...	673	325.00
†66	2½ to 10 Inches, R. H..	989	500.00

\* Pressure feed machine.

† Lead screw machine.

Nos. 30 to 37 have no cut-off attachment.



## MALLEABLE IRON PIPE VISES



SHUT

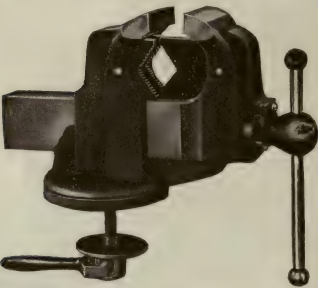


OPEN

Number.....	1	2	3	4
Holds Pipe from.....	$\frac{1}{8}$ to 2 Inch	$\frac{1}{8}$ to 3 Inch	$\frac{1}{4}$ to 4 Inch	2 to 6 Inch
Weight.....Pounds	16	30	53	76
Price, Complete....Each	10.00	14.00	24.00	30.00
Extra Jaws, Per Set of Three..Net	.60	.90	3.75	8.50
Extra Yoke.....Net	.60	.85		
Extra Screw.....Net	.25	.40	2.25	2.25
Extra Slide.....Net	.10	.15	.75	.80
Extra Handle.....Net	.15	.20		
Extra Bottom Piece..Net	.60	.75		
Extra Hook.....Net	.10	.15		

The Malleable Iron Pipe Vise is preferable to the Cast Iron Vise in every respect, being much lighter, more durable, and cheaper. Has interchangeable cut steel jaws, and is constructed to do the heaviest work, great care having been taken in manufacturing the various parts, and the strength put where it is most required.

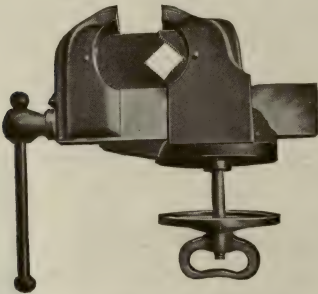
PARKER'S  
COMBINATION PIPE VISES



Number.....	87	88	88½	89½	288½	289½
Holds Pipe from...Inches	⅛ to 2	⅛ to 3	⅛ to 4	⅛ to 6	4 In. and Under	6 In. and Under
Price .....Each	16.00	22.00	32.00	45.00	32.00	45.00
Weight, pounds.....Each	41	59	94	141	105	155

Nos. 88½ and 89½ have no swivel and are bolted to the bench.

SMITH'S  
COMBINATION PIPE VISES



Number.....	1	2	3
Holds Pipe from.....Inches	⅛ to 2	¼ to 3	¼ to 4
Price.....Each	16.00	22.00	32.00
Weight, pounds.....Each	47	70	100

# MANUFACTURER'S STANDARD LIST OF MACHINE BOLTS

WITH SQUARE HEADS AND SQUARE NUTS, FINISHED POINTS



REVISED AUGUST 1, 1912

PRICE PER 100

Length Inches	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{8}$ to $1\frac{1}{2}$	2.40	2.80	3.60	5.20	7.70	10.50	15.10	22.50	30.00
2	2.56	3.00	3.86	5.58	8.25	11.20	16.00	23.70	31.50
$2\frac{1}{2}$	2.72	3.20	4.12	5.96	8.80	11.90	16.90	24.90	33.00
3	2.88	3.40	4.38	6.34	9.35	12.60	17.80	26.10	34.50
$3\frac{1}{2}$	3.04	3.60	4.64	6.72	9.90	13.30	18.70	27.30	36.00
4	3.20	3.80	4.90	7.10	10.45	14.00	19.60	28.50	37.50
$4\frac{1}{2}$	3.36	4.00	5.16	7.48	11.00	14.70	20.50	29.70	39.00
5	3.52	4.20	5.42	7.86	11.55	15.40	21.40	30.90	40.50
$5\frac{1}{2}$	3.68	4.40	5.68	8.24	12.10	16.10	22.30	32.10	42.00
6	3.84	4.60	5.94	8.62	12.65	16.80	23.20	33.30	43.50
$6\frac{1}{2}$	4.00	4.80	6.20	9.00	13.20	17.50	24.10	34.50	45.00
7	4.16	5.00	6.46	9.38	13.75	18.20	25.00	35.70	46.50
$7\frac{1}{2}$	4.32	5.20	6.72	9.76	14.30	18.90	25.90	36.90	48.00
8	4.48	5.40	6.98	10.14	14.85	19.60	26.80	38.10	49.50
9	4.80	5.80	7.50	10.90	15.95	21.00	28.00	40.50	52.50
10	5.12	6.20	8.02	11.66	17.05	22.40	30.40	42.90	55.50
11	5.44	6.60	8.54	12.42	18.15	23.80	32.20	45.30	58.50
12	5.76	7.00	9.06	13.18	19.25	25.20	34.00	47.70	61.50
13	6.08	7.40	9.58	13.94	20.35	26.60	35.80	50.10	64.50
14	6.40	7.80	10.10	14.70	21.45	28.00	37.60	52.50	67.50
15	6.72	8.20	10.62	15.46	22.55	29.40	39.40	54.90	70.50
16	7.04	8.60	11.14	16.22	23.65	30.80	41.20	57.30	73.50
17	7.36	9.00	11.66	16.98	24.75	32.20	43.00	59.70	76.50
18	7.68	9.40	12.18	17.74	25.85	33.60	44.80	62.10	79.50
19	8.00	9.80	12.70	18.50	26.95	35.00	46.60	64.50	82.50
20	8.32	10.20	13.22	19.26	28.05	36.40	48.40	66.90	85.50

Prices for bolts with special heads or nuts will be quoted on application.

UNLESS OTHERWISE SPECIFIED, BOLTS WITH SQUARE HEADS AND "HEXAGON" NUTS WILL ALWAYS BE FURNISHED, AND AT 10 PER CENT ADDED TO ABOVE LIST PRICES.

FOR STRENGTH OF BOLTS, SEE PAGE 741

## MANUFACTURER'S STANDARD LIST OF

## COACH OR LAG SCREWS

WITH SQUARE HEADS

PRICE PER 100

REVISED LIST ADOPTED NOVEMBER 12, 1908

Length Inches	$\frac{1}{4}$ and $\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ and $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1½	2.25	2.70	3.15	3.75				
2	2.45	2.96	3.47	4.11	6.00			
2½	2.65	3.22	3.79	4.47	6.50	9.20		
3	2.85	3.48	4.11	4.83	7.00	9.90	15.00	
3½	3.05	3.74	4.43	5.19	7.50	10.60	16.00	22.00
4	3.25	4.00	4.75	5.55	8.00	11.30	17.00	23.30
4½	3.45	4.26	5.07	5.91	8.50	12.00	18.00	24.60
5	3.65	4.52	5.39	6.27	9.00	12.70	19.00	25.90
5½	3.85	4.78	5.71	6.63	9.50	13.40	20.00	27.20
6	4.05	5.04	6.03	6.99	10.00	14.10	21.00	28.50
6½			6.35	7.35	10.50	14.80	22.00	29.80
7			6.67	7.71	11.00	15.50	23.00	31.10
7½			6.99	8.07	11.50	16.20	24.00	32.40
8			7.31	8.43	12.00	16.90	25.00	33.70
9			7.95	9.15	13.00	18.30	27.00	36.30
10				9.87	14.00	19.70	29.00	38.90
11				10.59	15.00	21.10	31.00	41.50
12				11.31	16.00	22.50	33.00	44.10

The following extras are to be understood as a part of this list:

Hexagon Heads, 10 per cent extra. Tee Heads, 10 per cent extra.

## HOOK PLATES, BEAM HOOKS AND COIL STANDS



### HOOK PLATES

Number of Hooks.....	1	2	3	4	5	6
For 1 in. pipe, 2½ ins. between centers.....Each	.09	.18	.23	.26	.32	.38
For 1½ in. pipe, 3 ins. between centers.....Each	.10	.21	.27	.32	.41	.52
For 1¾ in. pipe, 3½ ins. between centers.....Each	.15	.28	.43	.58	.72	.88
For 2 in. pipe, 4½ ins. between centers.....Each	.22	.43	.65	.90	1.15	1.35



### EXPANSION HOOK PLATES

Number of Hooks.....	1	2	3	4	5	6
For 1 in. pipe, 2½ ins. between centers.....Each	.15	.25	.35	.50	.60	.70
For 1½ in. pipe, 3 ins. between centers.....Each	.17	.27	.40	.60	.70	.80
For 1¾ in. pipe, 3½ ins. between centers.....Each	.25	.40	.60	.75	.90	1.00
For 2 in. pipe, 4½ ins. between centers.....Each		.60	.85	1.00	1.35	1.55

When Hook Plates are ordered, specifying a greater number of hooks than listed above, we will send two; for instance, an order calling for two 2 × 8 hook plates, we will send four 2 × 4.



### BEAM HOOKS, LONG SHANK

Size.....Inches	½	¾	1	1¼	1½	2	2½	3
Price.....Each	.13	.15	.18	.22	.24	.35	.65	.90

### LAUNDRY COIL STANDS

FOR 1 INCH PIPE

#### WITH MOVABLE HOOK PLATES

No. of Stand.....	4	6	8	10
Stand Only.....Each	2.00	2.75	3.50	4.25

#### NUMBER OF HOOKS EACH STAND WILL TAKE

Size of Hook.....Inches	1	1¼	1½	2
No. 4 Stand.....	6	5	5	4
No. 6 Stand.....	9	8	7	5
No. 8 Stand.....	12	10	8	7
No. 10 Stand.....	14	12	10	8
Standard Center to Center of Hooks . . . Inches	2½	3	3½	4½
Hooks Only.....Each	.06	.08	.10	.15





## EXPANSION PIPE HANGERS WITH SECTIONAL RING



**STYLE R**  
FOR 8 INCH AND  
SMALLER PIPE  
WITH LAG SCREW



**STYLE S**  
FOR 8 INCH AND  
SMALLER PIPE  
WITH CEILING PLATE



**STYLE SS**  
FOR 8 INCH AND  
SMALLER PIPE  
WITH BEAM CLAMP

### PRICE LIST, STYLES R AND S

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	.32	.33	.35	.45	.55	.65	.80
Size of Pipe Rings and Buttons are Tapped for...Inches	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Price.....Each	1.00	1.15	1.60	2.00	2.50	3.00	3.75
Size of Pipe Rings and Buttons are Tapped for...Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$

### PRICE LIST, STYLE SS WITH BEAM CLAMP

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....Each	1.00	1.00	1.05	1.15	1.25	1.35	1.50
Size of Pipe Rings and Buttons are Tapped for...Inches	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
Beam Clamp Only....Each	.75	.75	.75	.75	.75	.75	.75
Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Price.....Each	1.70	1.85	3.35	3.75	4.25	4.75	5.50
Size of Pipe Rings and Buttons are Tapped for...Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Beam Clamp Only....Inches	.75	.75	.75	1.75	1.75	1.75	1.75

Prices do not include pipe from lag screw, ceiling plate, or beam clamp to ring.

Pipe can be run and supported upon temporary wood hangers, and when in proper line these Sectional Hangers can be conveniently applied.



## BEAM CLAMPS

PATENTED

Number.....	1000	2000	4000	6000
Price.....Each	.75	1.75	3.75	6.00
Size of Pipe Supported...Inches	$4\frac{1}{2}$ & smaller	5 to 8	9 to 14	15 to 24
Size of Pipe Hub is Tapped for...Inches	$\frac{1}{8}$ - $\frac{1}{4}$ - $\frac{3}{8}$ - $\frac{1}{2}$	$\frac{3}{4}$		
Size of Rod Hub is Tapped for...Inches	$\frac{3}{8}$ - $\frac{1}{2}$ - $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$ - 1	$1\frac{1}{4}$ - $1\frac{3}{8}$
Width of Beam Flange Clamp will Fit...Inches	$2\frac{3}{4}$ to 7	$3\frac{1}{2}$ to $7\frac{1}{2}$	$4\frac{1}{4}$ to $7\frac{1}{2}$	$4\frac{1}{2}$ to $8\frac{1}{2}$

When ordering, give Catalogue No. and SIZE OF TAPPING in hub; also state whether tapping is to be for PIPE or ROD.

## EXPANSION PIPE HANGERS WITH SOLID RING



**EXPANSION  
PIPE HANGER  
WITH SOLID RING  
FOR 8 INCH AND  
SMALLER PIPE  
WITH CEILING PLATE**

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, Complete...Each	.17	.17	.18	.19	.25	.29	.36	.44
Price, Rings.....Each	.08	.08	.12	.15	.20	.25	.30	.40
Price, Plates.....Each	.08	.08	.08	.08	.09	.09	.10	.10
Price, Buttons.....Each	.06	.06	.06	.06	.07	.07	.08	.08
Size of Pipe, Rings and But- tons are Tapped for....Inches	1/4	3/8	3/8	3/8	3/8	3/8	1/2	1/2

Size.....Inches	3 1/2	4	4 1/2	5	6	7	8	
Price, Complete...Each	.55	.63	.90	1.12	1.35	1.80	2.25	
Price, Rings.....Each	.50	.60	.80	1.00	1.25	1.70	2.15	
Price, Plates.....Each	.10	.10	.10	.10	.10	.10	.10	
Price, Buttons.....Each	.08	.08	.08	.08	.08	.08	.08	
Size of Pipe, Rings and But- tons are Tapped for....Inches	1/2	1/2	1/2	3/4	3/4	3/4	3/4	

Prices do not include pipe from ceiling plate to ring; this will be at an extra price and furnished only when so specified. If pipe is desired, state distance from center of pipe to support.

## ADJUSTABLE STEEL PIPE HANGER



**EXTENSION BAR**

Furnished in 5 foot lengths.

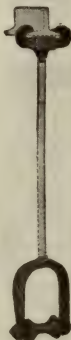
**RING AND BOLT**

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Ring and Bolt..Each	.08	.08	.09	.10	.12	.14	.16	.18	.20	.25	.30	.35	.45
Extension Bar...No.	0		1			2		3				5	
Width.....Inches	3/4		7/8			1		1 1/8				1 1/4	
Price...Per Foot	.08		.08			.09		.10				.20	

## EXPANSION PIPE HANGERS



**STYLE J**  
FOR 4 INCH AND  
LARGER PIPE  
WITH BEAM CLAMP



**STYLE T**  
FOR 8 INCH AND  
SMALLER PIPE  
WITH BEAM CLAMP



**STYLE T**  
FOR 9 INCH AND  
LARGER PIPE  
WITH BEAM CLAMP

## PRICE LIST STYLE J HANGER, 4 INCH AND LARGER

Size.....Inches	4	5	6	8	9	10	12	14
Price.....Each	3.00	4.00	4.50	5.00	5.50	6.00	7.00	10.00
Size of Eye Bolt for Turnbuckle.....Inches	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1
Beam Clamp Only.....Each	.75	1.75	1.75	1.75	3.75	3.75	3.75	3.75

Price includes Beam Clamp but not Turnbuckle or Rod from Beam Clamp to Turnbuckle.

## PRICE LIST STYLE T, 8 INCH AND SMALLER

Size.....Inches	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$
Price.....Each	.90	1.00	1.10	1.25	1.50	1.75	2.00
Size of Pipe Tap in Yoke.....Inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Beam Clamp Only.....Each	.75	.75	.75	.75	.75	.75	.75

Size.....Inches	4	4 $\frac{1}{2}$	5	6	7	8	
Price.....Each	2.25	2.50	3.00	3.50	4.00	5.00	
Size of Pipe Tap in Yoke.....Inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	
Beam Clamp Only.....Each	.75	.75	1.75	1.75	1.75	1.75	

Price includes Beam Clamp, but not Pipe from Beam Clamp to Yoke.

Style T for pipe 8 inches and smaller can be furnished with lag screw or ceiling plate similar to styles R and S.

## PRICE LIST STYLE T, 9 INCH AND LARGER

Size.....Inches	9	10	12	14
Price.....Each	14.00	15.00	17.00	20.00
Size of Eye Bolt for Turnbuckle.....Inches	$\frac{7}{8}$	$\frac{7}{8}$	1	1
Beam Clamp Only.....Each	3.75	3.75	3.75	3.75

Price includes Beam Clamp but not Turnbuckle or Rod from Turnbuckle to Beam Clamp.

## WALL BRACKETS



STANDARD PATTERN

Size . . . . .	Number	21	22	23	24	25	26
Price . . . . .	Each	3.00	5.00	6.00	8.00	12.50	15.00
Size of Pipe Will Support . .	Inches	4 and smaller	4½ to 6	7 to 8	9 to 10	12	14 to 15
Safe Load . . . . .	Tons	½	¾	1	1¼	1½	2

VIEW OF NO. 14  
BRACKET WITH  
WALKING-BOARD  
ATTACHMENTHEAVY PATTERN  
(PATENTED)

Size . . . . .	Number	11	12	13	14	15
Price . . . . .	Each	10.00	14.00	19.00	25.00	37.50
Size of Pipe Will Support . . . .	Inches	5 to 8	9 to 14	15 to 18	20 to 24	20 to 30
Safe Load . . . . .	Tons	1	2	3	4	5

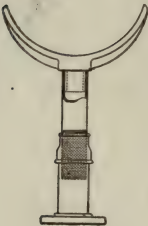
Walking-Board Attachment for 12 inch Board . . . . . Each 2.00

These Brackets are furnished without the Walking-Board Attachment, unless otherwise specified.

PIPE SUPPORTS



STYLE G



STYLE H



ADJUSTABLE  
PIPE SUPPORT  
NO PIPE  
FURNISHED

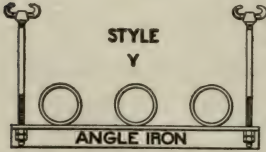
Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Style G.....Net, Each	.35	.40	.45	.50	.55	.60	.70	.80	1.00	1.20
Style ZZ.....Each			3.00	3.25	3.50	3.60	3.75	4.00	4.25	4.50
Shank will fit into Stan'd Pipe. Ins.	1	1	1¼	1¼	1½	1½	1½	2	2	2

Size.....Inches	9	10	12	14	15	16	18	20	22	24
Style G.....Net, Each	1.35	1.50	1.60	1.80	2.10	2.40	3.00	3.75	4.25	5.00
Style ZZ.....Each	5.00	6.00	6.50	7.00		7.50	9.50	12.00		15.00
Shank will fit into Stan'd Pipe. Ins.	2	2½	2½	3	3	3	3½	3½	4	4

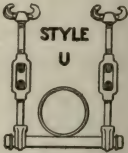
These Supports will be made to order with any other style or size Shank at special prices.

Style "H" Adjustable Pipe Support, for any size pipe and any height. Orders or inquiries should state distance from centre of pipe to floor.

PRICE ON APPLICATION



ADJUSTABLE ANGLE IRON HANGER  
FOR ONE OR MORE PIPES



ADJUSTABLE HANGER  
FOR ONE OR MORE PIPES

Styles U and Y Pipe Hangers are made to order only. Drawings must accompany orders or inquiries showing location and duty of hanger.



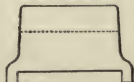
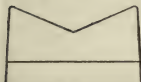
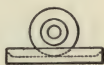
## PIPE SUPPORTS



STYLE C



STYLE D



STYLE F



ROLL

STYLE W  
END VIEWSTYLE W  
SIDE VIEWADJUSTABLE ROLL AND STAND  
SIZES 4 TO 24 INCH

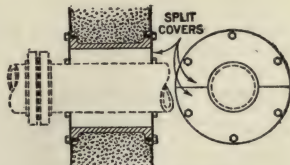
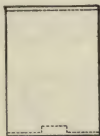
Pipe Size . . . . . Inches	1 to 2½	3 to 3½	4 to 6	7 to 10	12 to 15	16 to 20	22 to 24
Style C . . . . . Each	1.00	1.25	1.25	1.75	2.00	2.50	3.00
Style D . . . . . Each			1.00	1.50	1.75	2.25	2.50
Style F . . . . . Each			1.50	1.75	2.00	3.00	3.00
Style W . . . . . Each			4.25	6.50	9.00	12.00	
Rolls Only, Style C, Each	.35	.50	.50	.80	1.00	1.60	2.00
Rolls Only, Style D, Each			.40	.70	.90	1.50	1.75

In ordering always give size of pipe.

For combinations with Wall Brackets, see page 610.



No. 6 WALL ARCH



No. 10 WALL SLEEVE

No. 6 Wall Arch for pipe 12 inch and smaller.

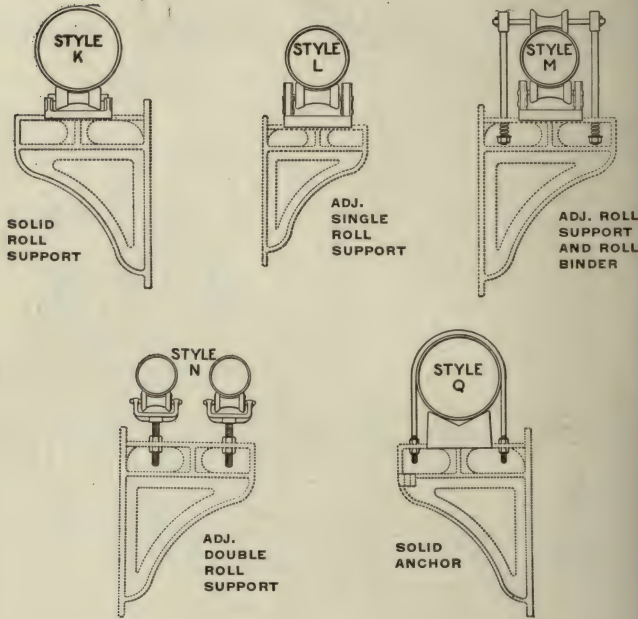
No. 10 Wall or Floor Sleeve for pipe 10 inch and smaller; the sleeve proper is 18 inches inside diameter; the end covers fit close around the pipe.

Orders or inquiries should state thickness of wall or floor.

PRICES ON APPLICATION

PIPE SUPPORTS

(PATENTED)



Style "Q" Anchor should be stayed from the sides by tie rods extending diagonally from the wall to the outside edge of the bracket. Provision is made on the bracket for attaching these tie rods.

Pipe Size.....Inches	4 to 6	7 to 10	12 to 15	16 to 20	22 to 24
Style K.....Each	1.25	1.75	2.00	2.50	3.00
Style L.....Each	5.50	6.50	8.00	9.00	10.00
Style M.....Each	12.00	14.00	17.00	19.00	21.00
Style N.....Each	12.00	14.00	17.00	19.00	21.00
Style Q.....Each	5.50	6.00	6.50	6.75	7.00

The above prices are for supports only. Add the price of bracket wanted. Prices of brackets, page 607.

In ordering always specify size of pipe, style of support required and whether bracket and support or bracket only is required.

# SEAMLESS DRAWN BRASS AND COPPER TUBING

## IRON PIPE SIZES

Size Inches	DIMENSIONS		APPROXIMATE WEIGHTS	
	Inside Diameter Inches	Outside Diameter Inches	Brass Per Lineal Foot Pounds	Copper Per Lineal Foot Pounds
1/8	.281	.405	.25	.26
1/4	.375	.540	.43	.45
3/8	.494	.675	.62	.65
1/2	.625	.840	.90	.95
3/4	.822	1.05	1.25	1.31
1	1.062	1.315	1.70	1.79
1 1/4	1.368	1.66	2.50	2.63
1 1/2	1.600	1.90	3.00	3.15
2	2.062	2.375	4.00	4.20
2 1/2	2.500	2.875	5.75	6.04
3	3.062	3.50	8.30	8.72
3 1/2	3.500	4.00	10.90	11.45
4	4.000	4.50	12.70	13.33
4 1/2	4.500	5.00	13.90	14.60
5	5.062	5.563	15.75	16.54
6	6.125	6.625	18.31	19.23
7	7.062	7.625	26.28	27.60
8	7.982	8.625	29.88	31.37

## EXTRA HEAVY

Size Inches	Inside Diameter Inches	Outside Diameter Inches	Brass Per Lineal Foot Pounds	Copper Per Lineal Foot Pounds
1/8	.205	.405	.370	.388
1/4	.294	.540	.625	.650
3/8	.421	.675	.830	.870
1/2	.542	.840	1.200	1.33
3/4	.736	1.050	1.660	1.75
1	.951	1.315	2.360	2.478
1 1/4	1.272	1.660	3.300	3.465
1 1/2	1.494	1.900	4.250	4.462
2	1.933	2.375	5.460	5.733
2 1/2	2.315	2.875	8.300	8.715
3	2.892	3.500	11.200	11.760
3 1/2	3.358	4.00	13.700	14.385
4	3.818	4.50	16.500	17.325
5	4.813	5.563	22.800	23.940
6	5.750	6.625	32.00	33.60

Furnished with plain ends, unless otherwise specified. Commercial lengths are 12 feet long.

PRICES ON APPLICATION.

## GAUGE TUBING

Price of seamless or brazed tubing, of diameters 1/8 inch to 10 inch and any gauge in which the different diameters are made, will be quoted on request, for direct shipment from mill.

## CAST IRON FLANGED PIPE

TABLE OF STANDARD DIMENSIONS

Nominal Diameter, Inches	Diam- eter of Bolt Circle Inches	Diam- eter of Bolts	Num- ber of Bolts	Diam- eter of Bolt Circle Inches	CLASS A 100 FOOT HEAD 43 POUNDS PRESSURE				CLASS B 200 FOOT HEAD 86 POUNDS PRESSURE				CLASS C 300 FOOT HEAD 130 POUNDS PRESSURE				CLASS D 400 FOOT HEAD 173 POUNDS PRESSURE			
					Weight, Pounds per			Thick- ness Inches	Weight, Pounds per			Thick- ness Inches	Weight, Pounds per			Thick- ness Inches	Weight, Pounds per			Thick- ness Inches
					Foot	Length	Single Flange		Foot	Length	Single Flange		Foot	Length	Single Flange		Foot	Length	Single Flange	
3	7.50	6.00	4	5/8	.39	13.0	168	5.8	.42	14.6	188	6.3	.45	15.5	199	6.6	.48	16.4	211	7.1
4	9.00	7.50	8	5/8	.42	18.0	234	9.0	.45	20.1	259	9.1	.48	21.3	275	9.7	.52	22.8	295	10.4
6	11.00	9.50	8	3/4	.44	27.9	358	11.8	.48	31.1	398	12.3	.51	32.9	421	12.8	.55	35.3	451	13.7
8	13.50	11.75	8	3/4	.46	38.7	498	16.9	.51	42.7	549	18.2	.56	48.0	614	19.0	.60	51.2	654	20.1
10	16.00	14.25	12	7/8	.50	51.9	671	23.9	.57	58.8	759	26.6	.62	65.5	840	27.3	.68	71.4	916	29.6
12	19.00	17.00	12	7/8	.54	67.0	876	35.8	.62	76.4	998	40.4	.68	85.4	1109	42.0	.75	93.7	1216	45.6
14	21.00	18.75	12	1	.57	82.3	1070	41.4	.66	94.7	231	47.3	.74	108.1	1397	49.6	.82	119.2	1539	54.5
16	23.50	21.25	16	1	.60	98.8	1290	52.5	.70	114.6	1495	60.1	.80	133.3	1727	63.9	.89	147.5	1910	70.2
18	25.00	22.75	16	1 1/8	.64	118.3	1528	54.5	.75	137.8	1779	62.5	.87	162.4	2083	66.9	.96	178.4	2287	73.4
20	27.50	25.00	20	1 3/8	.67	137.4	1783	66.8	.80	163.1	2114	78.7	.92	190.6	2454	83.3	1.03	212.3	2731	92.1
24	32.00	29.50	20	1 1/4	.76	186.5	2424	92.9	.89	217.3	2821	106.8	1.04	257.6	3321	114.7	1.16	286.0	3686	126.9
30	38.75	36.00	28	1 3/8	.88	266.1	3486	146.1	1.03	312.6	4077	162.9	1.20	366.9	4759	178.1	1.37	421.2	5436	191.0
36	46.00	42.75	32	1 1/2	.99	358.7	4748	221.9	1.15	418.7	5514	245.2	1.36	497.7	6519	273.3	1.58	581.9	7577	296.8
40	50.75	47.25	36	1 5/8	1.06	427.2	5684	279.1	1.23	497.0	6586	311.2	1.48	601.6	7921	350.7	1.72	703.4	9203	389.0
42	53.00	49.50	36	1 5/8	1.10	464.6	6195	310.0	1.28	542.2	7198	346.1	1.54	657.4	8660	385.3	1.78	764.1	10004	417.5
48	59.50	56.00	44	1 5/8	1.26	608.0	8112	408.1	1.42	687.2	9132	442.9	1.71	832.7	10979	493.4	1.96	960.8	12578	524.3

CONTINUED ON FOLLOWING PAGE

# CAST IRON FLANGED PIPE

(CONTINUED)

## TABLE OF STANDARD DIMENSIONS

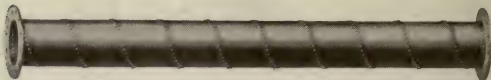
Nominal Diameter, Inches	Diam- eter of Bolt Circle Inches	Num- ber of Bolts	Diam- eter Bolts Inches	CLASS E 500 FOOT HEAD 217 POUNDS PRESSURE			CLASS F 600 FOOT HEAD 260 POUNDS PRESSURE			CLASS G 700 FOOT HEAD 304 POUNDS PRESSURE			CLASS H 800 FOOT HEAD 347 POUNDS PRESSURE		
				Weight, Pounds per			Weight, Pounds per			Weight, Pounds per			Weight, Pounds per		
				Thick- ness Inches	Foot Length	Single Flange	Thick- ness Inches	Foot Length	Single Flange	Thick- ness Inches	Foot Length	Single Flange	Thick- ness Inches	Foot Length	Single Flange
6	12.50	10.63	12	.58	37.7	495	21.3	.61	39.5	519	22.2	.65	42.9	560	22.9
8	15.00	13.00	12	.66	54.7	718	31.2	.71	60.6	794	33.1	.75	65.1	849	33.9
10	17.50	15.25	16	.74	78.8	1032	43.5	.80	84.7	1109	46.5	.86	92.5	1207	47.9
12	20.50	17.75	16	.82	104.2	1378	64.0	.89	112.4	1487	68.7	.97	124.6	1639	71.6
14	23.00	20.25	20	.90	133.1	1762	82.7	.99	146.2	1935	90.0	1.07	160.2	2108	92.8
16	25.50	22.50	20	.98	165.0	2192	106.0	1.08	180.8	2398	114.2	1.18	199.2	2627	118.6
18	28.00	24.75	24	1 1/4	202.3	2680	126.3	1.17	219.8	2915	138.8	1.28	244.6	3230	147.1
20	30.50	27.00	24	1 3/8	241.1	3200	153.4	1.27	262.5	3487	168.3	1.39	294.4	3894	180.7
24	36.00	32.00	24	1 3/8	328.5	4431	244.3	1.45	361.6	4877	268.9	1.75	446.2	5413	295.0
30	43.00	39.25	28	1 3/4	484.7	6534	358.5	1.73	538.0	7265	405.2				
36	50.00	46.00	32	1 7/8	674.2	9167	538.5	2.02	748.7	10040	577.8				

### PRICES ON APPLICATION

NOTE.—Thickness of flange equals approximately 1 1/2 times thickness of pipe plus 1/8 inch. Flanges drilled to "American 1914 Standard" Templates; send template if other drilling is required. Bolt holes drilled 1/8 inch larger than bolts. All dimensions in inches. Pipe made in 12 foot lengths and faced 1/8 inch short for gaskets; special short lengths made to order. Above are neat finished weights. Allowance must be made for variation and finish. All weights are approximate.



## STANDARD WEIGHT SPIRAL RIVETED PRESSURE PIPE



Extra Heavy and Double Extra Heavy Spiral Riveted Pipe for High Pressure Water Mains, Hydraulic Work, Vacuum Pipe Service, etc. Prices on application.

Inside Diameter  Inches	DIMENSIONS AND WEIGHT		
	Approximate Weight Per Foot Pounds	Thickness B. W. Gauge Number	Diameter of Flanges Inches
3	2¼	20	6
4	3	20	7
5	4	20	8
6	5	18	9
7	6	18	10
8	7	18	11
9	8	18	13
10	11	16	14
11	12	16	15
12	14	16	16
13	15	16	17
14	20	14	18
15	22	14	19
16	24	14	21¼
18	29	14	23¼
20	34	14	25¼
22	40	12	28¼
24	50	12	30
26	58	12	32
28	72	10	34
30	79	10	36
32	85	10	38
36	94	10	42
40	106	10	46

Prices on application.

SPIRAL RIVETED PIPE is usually furnished in 20 foot lengths. Prices of short lengths quoted on application.

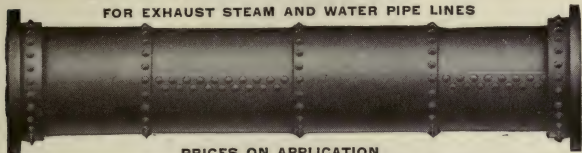
The flanges on this pipe are forged steel, and of special dimensions adopted by the Riveted Pipe Manufacturers. The dimensions and drilling templates do not conform to those of the American Standard. We can, however, furnish flanges according to the American Standard dimensions and drilling, at an extra price.

Flanges are always attached to the pipe at the factory, and can not be put on readily by the user, as the pipe is either asphalted or galvanized after the flanges are attached.

**GALVANIZED PIPE ONLY IS RECOMMENDED FOR USE AS EXHAUST STEAM PIPE**

## STRAIGHT SEAM STEEL RIVETED PIPE

FOR EXHAUST STEAM AND WATER PIPE LINES



## PRICES ON APPLICATION

Inside Diameter of Pipe, Inches	Thickness of Material U. S. Standard Gauge	Equivalent Thickness in Inches	Theoretical Safe Working Head, Feet	Approximate Weight per Lineal Foot Pounds	Inside Diameter of Pipe, Inches	Thickness of Material U. S. Standard Gauge	Equivalent Thickness in Inches	Theoretical Safe Working Head, Feet	Approximate Weight per Lineal Foot Pounds
16	16	.062	190	13.00	24	6	.200	405	59.00
16	14	.078	237	16.00	26	14	.078	145	25.50
16	12	.109	332	22.25	26	12	.109	203	35.50
16	11	.125	379	24.50	26	11	.125	233	39.50
16	10	.140	425	28.50	26	10	.140	261	44.25
18	16	.062	168	14.75	26	8	.171	319	54.00
18	14	.078	210	18.50	26	6	.200	373	64.00
18	12	.109	295	25.25	28	14	.078	135	27.25
18	11	.125	337	29.00	28	12	.109	188	38.00
18	10	.140	378	32.50	28	11	.125	216	42.25
18	8	.171	460	40.00	28	10	.140	242	47.50
20	16	.062	151	16.00	28	8	.171	295	58.00
20	14	.078	189	19.75	28	6	.200	346	69.00
20	12	.109	265	27.50	30	12	.109	176	39.50
20	11	.125	304	31.50	30	11	.125	202	45.00
20	10	.140	340	35.00	30	10	.140	226	50.50
20	8	.171	415	45.50	30	8	.171	276	61.75
22	16	.062	138	17.75	30	6	.200	323	73.00
22	14	.078	172	22.00	30	1/4	.250	404	90.00
22	12	.109	240	30.50	36	11	.125	168	54.00
22	11	.125	276	34.50	36	10	.140	189	60.50
22	10	.140	309	39.00	36	3/16	.187	252	81.00
22	8	.171	376	50.00	36	1/4	.250	337	109.00
24	14	.078	158	23.75	36	5/16	.312	420	135.00
24	12	.109	220	32.00	40	3/16	.187	226	90.00
24	11	.125	253	37.50	40	1/4	.250	303	120.00
24	10	.140	283	42.00	40	5/16	.312	378	150.00
24	8	.171	346	50.00	40	3/8	.375	455	180.00

The safe working heads given in above table are theoretical and based on ordinary working conditions. Judgment should be used in arriving at the practical safe working heads, due allowance being made for possible water hammer, settling, and the expansion and contraction of pipe, and causes which would tend to collapse same. The working heads, are based on the longitudinal seams being double riveted and the circumferential seams single riveted.

We can furnish end flanges made from the following materials: Cast Iron, Ferrosteel, Forged Steel and Malleable Iron. Where the service is light, we can also furnish Pressed Steel Flanges with diameters and drilling similar to those adopted by the Riveted Steel Pipe Manufacturers.

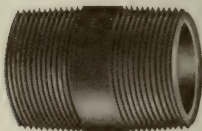
When ordering, always cover fully the following points: whether pipe is used for steam or water; maximum working pressure; material flanges are to be made of; and if painted or plain.

## BRASS NIPPLES

## IRON PIPE SIZE



CLOSE



SHOULDER

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

Size	Length Close *	Close	Length, Inches									
			1½	2	2½	3	3½	4	4½	5	5½	6
⅛	¾	.11	.13	.15	.17	.19	.21	.23	.25	.27	.29	.31
¼	⅞	.13	.16	.19	.22	.25	.28	.31	.34	.37	.40	.43
⅜	1	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.55
½	1⅛	.23	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
¾	1⅜	.28		.35	.42	.49	.56	.63	.70	.77	.84	.91
1	1½	.37		.44	.53	.62	.71	.80	.89	.98	1.07	1.16
1¼	1⅝	.60			.75	.88	1.01	1.14	1.27	1.40	1.53	1.66
1½	1¾	.70			.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95
2	2	1.00			1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
2½	2½	1.70				2.00	2.30	2.60	2.90	3.20	3.50	3.80
3	2⅞	2.50				2.90	3.30	3.70	4.10	4.50	4.90	5.30
3½	2¾	4.00						5.40	6.00	6.60	7.20	7.80
4	2⅞	4.75						6.15	6.85	7.55	8.25	8.95

\*These lengths conform to the Manufacturers' Standard.

Finished Brass Nipples, longer than close, will be furnished at an advance of 25 per cent over above prices.

**LONG SCREWS****WITH COUPLING AND LOCK NUT FACED**

Size.....Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Standard Length..Inches	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	8 1/2	9
Price.....Each	.30	.35	.40	.55	.75	1.00	1.30	1.70	2.70	3.70	5.40	6.60
Price, Galv....Each	.35	.40	.50	.66	1.00	1.25	1.60	2.10	3.10	4.70	6.50	7.75

Long Screws, longer than Standard, made to order and charged as CUT PIPE, with Threads, Couplings and Lock Nuts, extra.

In ordering, always specify the length of thread wanted.

Extra Heavy Long Screws made to order from Extra Strong pipe.

**FACED LOCK NUTS****MALLEABLE IRON**

Size...Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price...Each	.08	.09	.10	.12	.15	.20	.25	.30	.35	.45
Price, Galv.Each	.11	.13	.15	.18	.22	.30	.35	.45	.50	.65

**FACED COUPLINGS**

Size. Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Price. Each	.09	.10	.12	.16	.22	.30	.40	.50	.70	.90	1.20	1.50	2.10	2.40	3.60
Price, Galv.Each	.14	.15	.18	.24	.33	.45	.60	.75	1.00	1.35	1.80	2.25			

Sizes 3 inch and smaller are malleable iron.

Sizes 3 1/2 to 6 inch are wrought.

**TANK NIPPLES****6 INCHES LONG OVER ALL**

Size...Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price...Each	.10	.10	.12	.13	.18	.24	.29	.38	.68	.85
Price, Galv.Each	.17	.17	.18	.21	.28	.38	.46	.61	1.00	1.30

These Nipples have an American Briggs Standard Lock-Nut Thread 4 inches long on one end; the other end has a Standard Pipe Thread.

## WROUGHT NIPPLES

## GALVANIZED

## RIGHT HAND

TABLE OF SIZES AND LENGTHS

LENGTH, INCHES						Size, Inches	PRICES		PRICES OF EXTRA LONG NIPPLES											
*Close	*Short	LONG					Close or Short	Long	INCHES											
									4	5	6	7	8	9	10	11	12			
$\frac{3}{4}$	1½	2	2½	3	3½	$\frac{1}{8}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34			
$\frac{7}{8}$	1½	2	2½	3	3½	$\frac{1}{4}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34			
1	1½	2	2½	3	3½	$\frac{3}{8}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34			
1½	1½	2	2½	3	3½	$\frac{1}{2}$	.06	.11	.13	.16	.18	.23	.26	.28	.31	.33	.36			
1¾	2	2½	3	3½	4	$\frac{3}{4}$	.08	.14		.18	.21	.26	.29	.32	.35	.38	.41			
1½	2	2½	3	3½	4	1	.11	.19		.24	.28	.34	.38	.42	.47	.51	.55			
1¾	2½	3	3½	4	4½	1¼	.17	.29		.32	.38	.45	.51	.57	.63	.69	.75			
1¾	2½	3	3½	4	4½	1½	.21	.35		.39	.46	.55	.63	.70	.77	.84	.91			
2	2½	3	3½	4	4½	2	.27	.47		.52	.61	.74	.83	.93	1.03	1.13	1.23			
2½	3	3½	4	4½	5	2½	.56	.86			1.00	1.26	1.41	1.56	1.71	1.86	2.01			
2¾	3	3½	4	4½	5	3	.70	1.10			1.30	1.60	1.80	2.00	2.20	2.40	2.60			
2¾	4	4½	5	5½	6	3½	1.20	1.70				2.10	2.35	2.60	2.85	3.15	3.40			
2¾	4	4½	5	5½	6	4	1.35	1.87				2.30	2.60	2.90	3.20	3.50	3.80			
2¾	4	4½	5	5½	6	4½	1.85	2.60				3.30	3.65	4.05	4.45	4.85	5.25			
3	4½	5	5½	6	6½	5	2.30	3.15				3.75	4.20	4.60	5.00	5.40	5.85			
3½	4½	5	5½	6	6½	6	2.80	4.25				4.50	5.00	5.55	6.05	6.60	7.15			
¾	5					7	4.25					4.95	5.65	6.35	7.05	7.75	8.45	9.20		
¾	5					8	5.00					5.80	6.65	7.50	8.35	9.25	10.10	10.95		

\*These lengths conform to the Manufacturers' Standard.



# WROUGHT NIPPLES

## PLAIN, RIGHT AND LEFT

### TABLE OF SIZES AND LENGTHS

LENGTH, INCHES						Size, Inches	PRICES		PRICES OF EXTRA LONG NIPPLES									
*Close	*Short	LONG					Close or Short	Long	INCHES									
									4	5	6	7	8	9	10	11	12	
$\frac{3}{4}$	1½	2	2½	3	3½	$\frac{1}{8}$	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27	
$\frac{7}{8}$	1½	2	2½	3	3½	$\frac{1}{4}$	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27	
1	1½	2	2½	3	3½	$\frac{3}{8}$	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27	
1⅛	1½	2	2½	3	3½	$\frac{1}{2}$	.07	.10	.11	.13	.16	.18	.21	.24	.27	.29	.31	
1⅜	2	2½	3	3½	4	$\frac{3}{4}$	.08	.12		.15	.17	.23	.25	.27	.29	.32	.35	
1½	2	2½	3	3½	4	1	.11	.18		.20	.24	.31	.33	.37	.41	.45	.48	
1⅝	2½	3	3½	4	4½	1¼	.15	.23		.27	.32	.39	.45	.50	.55	.60	.65	
1¾	2½	3	3½	4	4½	1½	.18	.27		.34	.39	.48	.52	.60	.67	.72	.80	
2	2½	3	3½	4	4½	2	.24	.36		.43	.51	.67	.72	.80	.87	.96	1.03	
2½	3	3½	4	4½	5	2½	.52	.79			.91	1.20	1.30	1.40	1.55	1.68	1.80	
2⅝	3	3½	4	4½	5	3	.65	.96			1.13	1.44	1.60	1.77	1.93	2.10	2.27	
2¾	4	4½	5	5½	6	3½	1.00	1.40				1.75	1.95	2.15	2.35	2.55	2.75	
2⅞	4	4½	5	5½	6	4	1.15	1.60				2.00	2.25	2.50	2.75	3.00	3.25	

\*These lengths conform to the Manufacturers' Standard.

ADD 60 PER CENT TO ABOVE PRICES FOR GALVANIZED RIGHT AND LEFT NIPPLES.

## WROUGHT NIPPLES



CLOSE



SHOULDER

TABLE OF SIZES AND LENGTHS KEPT IN STOCK

LENGTH, INCHES						Size, Inches	PRICES		PRICES OF EXTRA LONG NIPPLES									
*Close	*Short	LONG					Close or Short	Long	INCHES									
									4	5	6	7	8	9	10	11	12	
¾	1½	2	2½	3	3½	⅛	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19	
⅞	1½	2	2½	3	3½	¼	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19	
1	1½	2	2½	3	3½	⅜	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19	
1⅛	1½	2	2½	3	3½	½	.05	.07	.08	.10	.12	.14	.16	.18	.20	.22	.23	
1⅜	2	2½	3	3½	4	¾	.06	.09		.11	.13	.17	.18	.20	.22	.24	.26	
1½	2	2½	3	3½	4	1	.08	.13		.15	.18	.23	.25	.28	.31	.34	.36	
1⅝	2½	3	3½	4	4½	1¼	.11	.17		.20	.24	.29	.33	.36	.40	.44	.47	
1¾	2½	3	3½	4	4½	1½	.13	.20		.25	.29	.36	.40	.45	.50	.54	.59	
2	2½	3	3½	4	4½	2	.18	.27		.32	.38	.50	.54	.59	.65	.72	.77	
2½	3	3½	4	4½	5	2½	.39	.59			.68	.90	.97	1.06	1.17	1.26	1.33	
2⅝	3	3½	4	4½	5	3	.48	.72			.85	1.08	1.20	1.33	1.45	1.58	1.70	
2¾	4	4½	5	5½	6	3½	.75	1.05				1.30	1.45	1.60	1.75	1.90	2.05	
2⅞	4	4½	5	5½	6	4	.85	1.20				1.52	1.69	1.87	2.05	2.22	2.40	
2⅞	4	4½	5	5½	6	4½	1.25	1.70				2.25	2.50	2.75	2.95	3.17	3.40	
3	4½	5	5½	6	6½	5	1.55	2.45				2.58	2.83	3.10	3.35	3.60	3.85	
3⅛	4½	5	5½	6	6½	6	1.85	2.90				3.05	3.35	3.70	4.00	4.30	4.65	
3¼	5					7	3.20				3.60	4.05	4.45	4.90	5.30	5.75	6.15	
3½	5					8	3.55				4.05	4.55	5.05	5.50	6.00	6.50	7.00	
3⅝	5					9	5.25						6.50	7.10	7.75	8.40	9.00	
3⅞	5					10	6.75						8.25	8.90	9.70	10.40	11.15	
4½	6					12	8.00						10.00	10.80	11.75	12.70	13.65	

\*These lengths conform to the Manufacturers' Standard.

Nipples made to order from Extra Strong pipe at double above list.

Nipples longer than 12 inch, made to order and charged as cut pipe, and threads extra.



## RETURN BENDS

MADE FROM EXTRA STRONG WROUGHT PIPE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Distance, Center to Center of Pipe .....Inches	$4\frac{1}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	6	8	8
Length, Center to End .....Inches	$3\frac{1}{2}$	$3\frac{3}{4}$	5	6	8	8
Price.....Each	.90	1.10	1.25	1.75	2.75	4.00



## QUARTER BENDS

MADE FROM EXTRA STRONG WROUGHT PIPE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Radius.....Inches	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$4\frac{3}{4}$	$6\frac{3}{4}$	$6\frac{3}{4}$
Length, Center to End.....Inches	$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$
Price.....Each	.45	.55	.75	1.25	2.00	3.25



## GOOSE NECKS

MADE FROM EXTRA STRONG WROUGHT PIPE

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$
Least Distance between Centers Pipe can be bent, Inches	4	$4\frac{1}{2}$	6
Least Length Center to End Goose Necks can be made.....Inches	$3\frac{3}{4}$	$4\frac{1}{4}$	6

Prices on application.

We will quote prices on Bends differing from above, upon receipt of dimensions and number required.

WROUGHT COUPLINGS



STANDARD



CAR HEATER

STANDARD

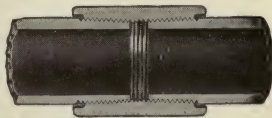
Size of Pipe	Price Black	Price Galv.	Price Right and Left Black	Nominal Outside Diameter	Length of Coupling	Average Weight of Coupling	No. of Threads Per Inch of Screw
Inches	Each	Each	Each	Inches	Inches	Pounds	
1/8	.05	.06		1 3/8	1 5/8	.03	27
1/4	.05	.06	.07	3/4	1 1/2	.07	18
3/8	.06	.08	.08	3/4	1 5/8	.11	18
1/2	.07	.10	.11	1 3/8	1 5/8	.15	14
3/4	.10	.13	.15	1 3/8	1 5/8	.25	14
1	.13	.18	.20	1 5/8	1 11/8	.42	11 1/2
1 1/4	.17	.25	.25	1 3/8	2 1/8	.60	11 1/2
1 1/2	.21	.32	.30	2 1 5/16	2 5/8	.81	11 1/2
2	.28	.40	.50	2 3/8	2 9/8	1.18	11 1/2
2 1/2	.40	.55	.85	3 5/8	2 7/8	1.70	8
3	.60	.80	1.20	3 1 5/8	3 1/8	2.45	8
3 1/2	.80	1.05	1.60	4 1/8	3 7/8	3.40	8
4	1.00	1.40	2.00	4 1 5/8	3 7/8	3.50	8
4 1/2	1.50	2.00		5 1 3/8	3 5/8	4.70	8
5	1.65	2.25		6 1/4	4 1/8	8.50	8
6	2.40	3.25		7 9/8	4 1/8	9.70	8
7	3.25			8 9/8	4 1/8	11.10	8
8	4.25			9 1/4	4 5/8	13.60	8
9	5.50			10 5/8	5 1/8	17.40	8
10	7.50			11 5/8	6 1/8	31.10	8
12	10.00			13 7/8	6 1/8	44.20	8

1 1/4 inch turned and faced Couplings to fit inside of 2 inch wrought pipe. Price on application.

CAR HEATER

Size	Actual Outside Diameter	Length of Couplings	PRICE			
			R. H. Black	R. and L. Black	R. H. Galvanized	R. and L. Galvanized
Inches	Inches	Inches	Each	Each	Each	Each
1/2	1.13	1.88	.14	.20	.20	.25
3/4	1.44	2.13	.20	.30	.25	.35
1	1.63	2.38	.26	.40	.32	.45
1 1/4	2.13	2.13	.34	.45	.42	.55
1 1/2	2.31	2.87	.42	.55	.55	.70
2	2.81	3.13	.56	.70	.75	.90

## EXTRA HEAVY OR HYDRAULIC COUPLINGS



HYDRAULIC COUPLINGS

HYDRAULIC RECESSED COUPLINGS

Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Black... Each	.14	.14	.20	.26	.34	.42	.56	.80	1.20	1.60	2.00
Price, Galv.... Each	.20	.20	.25	.32	.42	.55	.75	1.05	1.50	1.90	3.00
Price, Recessed, Black.. Each	.25	.25	.30	.35	.45	.55	.70	.95	1.40	1.85	2.25
Price, Recessed, Galv.. Each	.30	.30	.35	.40	.55	.70	.90	1.20	1.70	2.15	3.25
Price, Right and Left.. Each		.20	.30	.40	.45	.55	.70				
Price, Right and Left, Galv. Ea.		.25	.35	.45	.55	.70	.90				
Outside Diam. Inches	.95	1.13	1.44	1.63	2.07	2.31	2.81	3.31	4.00	4.63	5.13
Length.....Inches	1.50	1.88	2.13	2.38	2.63	2.87	3.13	3.50	3.69	4.25	4.25
Threads to Inch of Screw...	18	14	14	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	8	8	8	8
Weight, Each.....Pounds	.23	.28	.50	.56	.90	1.35	1.80	2.40	3.46	5.25	6.80

These Couplings are made extra heavy and long, and cut with a perfect taper and longer thread.

Threads for these Couplings may be cut with an ordinary die.

The object of the Recessed Couplings is to make a better joint, protecting the pipe at the weak point, viz.: That part left exposed from cutting the thread and not covered with the ordinary coupling.

## LINE, TUBING AND DRIVE COUPLINGS

Size.....Inches	$4\frac{1}{2}$	5	6	7	8	9	10
Price, Recessed, Black.. Each	4.00	4.80	5.60	7.70	8.00	10.00	12.00
Price, Recessed, Galv... Each	5.70	6.90	8.00	11.10	11.60	14.50	17.50

## XX HYDRAULIC COUPLINGS

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Black..... Each	.40	.55	.70	.85	1.15	1.60
Price, Recessed, Black..... Each	.50	.65	.85	1.00	1.30	1.85
Outside Diameter.....Inches	1.66	1.90	2.22	2.44	3.19	3.62
Length.....Inches	1.88	2.63	2.88	3.13	3.38	3.63
Threads to Inch of Screw.....	14	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	8
Weight, Each.....Pounds	.70	1.12	1.50	1.88	3.55	4.50



## STANDARD CASING COUPLINGS

Size. . . Inches	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5½	5¾
Black . . . Each	.16	.20	.25	.30	.35	.40	.46	.52	.60	.68	.74	.80	.90	1.00	1.20
Galvanized Ea.	.23	.28	.35	.42	.50	.57	.65	.73	.85	1.00	1.05	1.15	1.30	1.40	1.70
R. & L., Black Ea.	1.70	1.80	2.00	2.10	2.50	2.60	3.00	3.10	3.70	3.95	4.55	4.85	5.25	5.50	6.10

Size. . . Inches	6¼	6½	7¼	7½	8¼	8½	9½	10½	11½	12½	13½	14½	15½
Black . . . Each	1.35	1.50	1.65	1.75	2.25	2.85	3.50	4.50	5.15	6.75	7.60	8.75	10.00
Galvanized Ea.	1.90	2.15	2.35	2.50	3.25	3.75	5.00	6.15	6.95	8.85	10.15	11.75	13.15
R. & L., Black Ea.	6.45	7.10	7.55	8.30	9.30	10.25	11.80	13.25	14.25	16.80	18.65	21.00	22.25

## COUPLINGS FOR LARGE O. D. PIPE

O. D. Pipe Size Inches	Steam Pipe Couplings Each	Recessed Couplings Each
14	12.50	10.00
15	18.75	13.00
16	25.00	20.00
17		32.90
18		39.50
20		52.50

# WROUGHT IRON AND STEEL PIPE

## PIPE MILL TESTS

There are no established standards for mill tests on wrought pipe.

The various manufacturers have their own schedule of tests which average as follows:

### STANDARD BUTT WELDED WROUGHT PIPE

The tests on  $\frac{1}{8}$  to 3 inch, inclusive, range from 700 to 1,000 pounds, according to size.

### STANDARD LAP WELDED WROUGHT PIPE

The tests on  $1\frac{1}{2}$  to 12 inch, inclusive, range from 500 to 1,000 pounds, according to size.

### EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on  $\frac{1}{8}$  to 3 inch, inclusive, range from 700 to 1,500 pounds according to size.

### EXTRA STRONG LAP WELDED WROUGHT PIPE

The tests on  $1\frac{1}{2}$  to 12 inch, inclusive, range from 1,100 to 2,500 pounds, according to size.

### DOUBLE EXTRA STRONG BUTT WELDED WROUGHT PIPE

The tests on  $\frac{1}{8}$  to  $2\frac{1}{2}$  inch, inclusive, range from 700 to 2,200 pounds, according to size.

### DOUBLE EXTRA STRONG LAP WELDED WROUGHT PIPE

The tests on  $1\frac{1}{2}$  to 8 inch, inclusive, range from 2,000 to 3,000 pounds, according to size.

The above tests are made by the mill simply to detect any defects in the weld or other portions of the pipe and are not made as a basis from which to figure safe working pressures.

## SAFE WORKING PRESSURES

Numerous factory tests to determine the actual bursting pressure of wrought pipe have proved Barlow's formula to be correct. This formula follows:

$$\text{BP equals } \frac{2T \times \text{TS}}{\text{OD}}$$

in which BP equals bursting pressure in pounds per square inch.

T equals thickness of the wall in inches.

OD equals outside diameter of the pipe in inches.

TS equals tensile strength of material per square inch.

The value of TS was determined from actual tests to be 40,000 pounds per square inch for butt welded steel pipe and 50,000 pounds for lap welded steel pipe.

The table on the following page is based on the formula given above. The working pressures given are based on a factor of safety of eight.

# WROUGHT STEEL PIPE BURSTING AND WORKING PRESSURES

STANDARD			EXTRA STRONG		DOUBLE EXTRA STRONG		LARGE O. D.			
Size Inches	Bursting Pressure Barlow's Formula	Working Pressure Factor 8	Bursting Pressure Barlow's Formula	Working Pressure Factor 8	Bursting Pressure Barlow's Formula	Working Pressure Factor 8	$\frac{3}{8}$ inch Thick Bursting Pressure Barlow's Formula	Working Pressure Factor 8	$\frac{1}{2}$ inch Thick Bursting Pressure Barlow's Formula	Working Pressure Factor 8
$\frac{1}{8}$	13,432	1679	18,760	3095						
$\frac{1}{4}$	13,032	1629	17,624	2953						
$\frac{3}{8}$	10,784	1348	14,928	1866						
$\frac{1}{2}$	10,384	1298	14,000	1750						
$\frac{3}{4}$	8,608	1076	11,728	1716	28,000	3500	23,464	2933		
1	8,088	1011	10,888	1611	21,776	2722	21,776	2722		
$1\frac{1}{4}$	6,744	843	9,200	1150	18,408	2301	18,408	2301		
$1\frac{1}{2}$	6,104	763	8,416	1052	16,840	2105	16,840	2105		
2	5,184	648	7,336	917	14,680	1835	14,680	1835		
$2\frac{1}{2}$	5,648	706	7,680	960	15,360	1920	15,360	1920		
3	4,936	617	6,856	857	13,714	1714	13,714	1714		
$3\frac{1}{2}$	5,610	701	7,950	994	15,900	1987	15,900	1987		
4	5,266	658	7,480	935	14,970	1871	14,970	1871		
$4\frac{1}{2}$	4,940	618	7,100	887	14,200	1775	14,200	1775		
5	4,630	579	6,740	842	13,480	1685	13,480	1685		
6	4,220	528	6,520	815	13,040	1630	13,040	1630		
7	3,940	493	6,550	819	11,470	1434	11,470	1434		
8	3,730	466	5,780	722	10,140	1267				
9	3,550	444	5,190	649						
10	3,390	424	4,650	581						
12	2,940	368	3,920	490			2,680	335	3,570	446
14							2,500	313	3,333	417
15							2,340	293	3,120	390
16							2,080	260	2,770	346
18							1,870	234	2,500	313
20							1,700	213	2,270	284
22							1,560	195	2,080	260
24										

In the above table, butt welded pipe was figured on sizes 3 inch and smaller and lap welded pipe sizes  $3\frac{1}{2}$  inch and larger.

## PIPE PRACTICE

### MEASUREMENT OF PIPE

On orders calling for commercial sizes of pipe to be furnished with threads and couplings in sizes  $\frac{1}{8}$  to 12 inch, inclusive, where orders specify quantity in lineal feet it is understood that random lengths, threaded both ends, with coupling on one end, will be shipped, and the measurement is charged from end to end, that is, over all including coupling.

Orders or inquiries covering cut lengths of any size should specify whether plain ends, threads only, threads and couplings, or flanges are required. A separate charge is made for couplings or flanges, either loose or screwed on pipe, when pipe is ordered cut to specified lengths.

Orders or inquiries covering pipe larger than 12 inch should specify the actual outside diameter of the pipe and the thickness of the wall. See table, page 629.

Standard weight pipe is listed and carried in stock threaded and coupled and will be shipped unless order specifies otherwise. Extra Strong, Double Extra Strong, Hydraulic, and Large O. D. Pipe is listed plain ends only and will be so shipped unless order specifies otherwise. An extra charge is made for threads and couplings on these weights.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge is made. Such pipe is furnished in random lengths 20 feet and shorter.

Random lengths of Extra Strong and Double Extra Strong Pipe are considered to be 12 to 22 feet, we to have the privilege of supplying not to exceed 5 per cent of total order in lengths 6 to 12 feet. For cut lengths of any size an extra charge above random lengths will be made.

For galvanized or asphalted pipe an extra charge above black will be made.

Sizes 8, 10 and 12 inch Standard Pipe are listed in several weights and orders or inquiries should specify the weight required.

### PRICE LIST OF

### STANDARD THREADS FOR WROUGHT IRON PIPE

Size...Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$
Price...Each	.05	.05	.05	.05	.05	.06	.07	.08	.10	.15	.20	.25	.35	.45
Size...Inches	5	6	7	8	9	10	12	14	15	16	18	20	22	24
Price...Each	.55	.70	.85	1.00	1.25	1.50	2.50	3.50	3.50	5.00	8.00	10.00	12.50	15.00

### PRICE LIST OF LOCK-NUT THREADS

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Price.....Each	.10	.10	.10	.10	.12	.14	.16	.20	.30	.40	.50	.70

### DRILLING AND TAPPING PIPE HEADERS

#### MADE FROM EITHER 3 OR 4 INCH PIPE

Size of Holes for Iron Pipe.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$
Price per Hole, Drilled and Tapped in Standard Pipe.	.15	.15	.20	.25
Price per Hole, Drilled and Tapped in Extra Heavy Pipe	.18	.18	.25	.30

### DRILLING AND TAPPING PIPE HEADERS

#### MADE FROM EITHER 5 OR 6 INCH PIPE

Size of Holes for Iron Pipe.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Price per Hole, Drilled and Tapped in Standard Pipe.....	.18	.18	.25	.30	.40	.45
Price per Hole, Drilled and Tapped in Extra Heavy Pipe.....	.20	.20	.30	.35	.45	.50

# PRICE LIST—WROUGHT PIPE

## BLACK AND GALVANIZED

AS ADOPTED JANUARY 1, 1913

TO TAKE THE PLACE OF ALL PREVIOUS LISTS AND SUBJECT  
TO CHANGE WITHOUT NOTICE

Nominal In- side Diam.	STANDARD			EXTRA STRONG		DOUBLE EXTRA STRONG	
	Price	Nominal Weight	Nominal Weight Per Foot Threaded and Coupled	Price	Nominal Weight	Price	Nominal Weight
	Per Foot	Per Foot Plain Ends		Per Foot	Per Foot Plain Ends	Per Foot	Per Foot Plain Ends
1/8	.05 1/2	.244	.245	.12	.314		
1/4	.06	.424	.425	.07 1/2	.535		
3/8	.06	.567	.568	.07 1/2	.738		
1/2	.08 1/2	.850	.852	.11	1.087	.32	1.714
3/4	.11 1/2	1.130	1.134	.15	1.473	.35	2.440
1	.17	1.678	1.684	.22	2.171	.37	3.659
1 1/4	.23	2.272	2.281	.30	2.996	.52 1/2	5.214
1 1/2	.27 1/2	2.717	2.731	.36 1/2	3.631	.65	6.408
2	.37	3.652	3.678	.50 1/2	5.022	.91	9.029
2 1/2	.58 1/2	5.793	5.819	.77	7.661	1.37	13.695
3	.76 1/2	7.575	7.616	1.03	10.252	1.86	18.583
3 1/2	.92	9.109	9.202	1.25	12.505	2.30	22.850
4	1.09	10.790	10.889	1.50	14.983	2.76	27.541
4 1/2	1.27	12.538	12.642	1.80	17.611	3.26	32.530
5	1.48	14.617	14.810	2.08	20.778	3.86	38.552
6	1.92	18.974	19.185	2.86	28.573	5.32	53.160
7	2.38	23.544	23.769	3.81	38.048	6.35	63.079
8	2.50	24.696	25.000				
8	2.88	28.554	28.809	4.34	43.388	7.25	72.424
9	3.45	33.907	34.188	4.90	48.728		
10	3.20	31.201	32.000				
10	3.50	34.240	35.000				
10	4.12	40.483	41.132	5.48	54.735		
11	4.63	45.557	46.247	6.10	60.075		
12	4.50	43.773	45.000	6.55	65.415		
12	5.07	49.562	50.706				

# HYDRAULIC WROUGHT PIPE

SIZES 9, 10, 11 AND 12 INCH

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size		THICKNESS							
		Fraction % In.		3/4 In.		7/8 In.		1 In.	
		Decimal .625		.75		.875		1.00	
I. D.	O. D.	List	Weight	List	Weight	List	Weight	List	Weight
9	9 5/8	6.01	60.08	7.11	71.09	8.18	81.77	9.22	92.12
10	10 3/4	6.76	67.59	8.01	80.10	9.23	92.28	10.42	104.13
11	11 3/4	7.43	74.26	8.82	88.11	10.17	101.63	11.49	114.81
12	12 3/4	8.10	80.94	9.62	96.12	11.10	110.97	12.55	125.49



# PRICE LIST OF LARGE O. D. WROUGHT PIPE

REVISED AND ADOPTED JANUARY 1, 1913

TO TAKE THE PLACE OF ALL PREVIOUS LISTS AND SUBJECT TO CHANGE  
WITHOUT NOTICE

Out- side Diam- eter of Pipe Inches	$\frac{1}{4}$ INCH THICK	$\frac{5}{16}$ INCH THICK	$\frac{3}{8}$ INCH THICK	$\frac{7}{16}$ INCH THICK	$\frac{1}{2}$ INCH THICK	$\frac{9}{16}$ INCH THICK	$\frac{5}{8}$ INCH THICK	$\frac{3}{4}$ INCH THICK	1 INCH THICK
	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot	Price Per Foot
14	3.68	4.57	5.46	6.34	7.21	8.08	8.93	10.62	13.89
15	3.94	4.91	5.86	6.81	7.75	8.68	9.60	11.42	14.96
16	4.21	5.24	6.26	7.28	8.28	9.28	10.27	12.22	16.03
17	4.48	5.57	6.66	7.74	8.82	9.88	10.94	13.02	17.09
18	4.74	5.91	7.06	8.21	9.35	10.48	11.60	13.82	18.16
20		6.58	7.86	9.15	10.42	11.68	12.94	15.42	20.36
21		6.91	8.27	9.61	10.95	12.28	13.61	16.23	
22		7.24	8.67	10.08	11.49	12.88	14.27	17.03	
24			9.47	11.01	12.55	14.09	15.61	18.63	
26			10.27	11.95	13.62	15.29	16.94	20.23	
28				12.88	14.69	16.49	18.28	21.83	
30				13.82	15.76	17.69	19.61	23.43	

## NOMINAL WEIGHT IN POUNDS PER FOOT—STANDARD O. D. PIPE

Out- side Diam- eter of Pipe Inches	$\frac{1}{4}$ INCH THICK	$\frac{5}{16}$ INCH THICK	$\frac{3}{8}$ INCH THICK	$\frac{7}{16}$ INCH THICK	$\frac{1}{2}$ INCH THICK	$\frac{9}{16}$ INCH THICK	$\frac{5}{8}$ INCH THICK	$\frac{3}{4}$ INCH THICK	1 INCH THICK
	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds	Weight Per Foot Pounds
14	36.71	45.68	54.57	63.37	72.10	80.73	89.28	106.13	138.84
15	39.38	49.02	58.57	68.04	77.43	86.73	95.95	114.14	149.52
16	42.05	52.36	62.58	72.72	82.77	92.74	102.63	122.15	160.20
17	44.72	55.69	66.58	77.39	88.11	98.75	109.30	130.16	170.88
18	47.39	59.03	70.59	82.06	93.45	104.76	115.98	138.17	181.56
20		65.71	78.60	91.41	104.13	116.77	129.33	154.19	202.92
21		69.04	82.60	96.08	109.47	122.78	136.00	162.20	
22		72.38	86.61	100.75	114.81	128.79	142.68	170.21	
24			94.62	110.10	125.49	140.80	156.03	186.23	
26			102.63	119.44	136.17	152.82	169.38	202.25	
28				128.79	146.85	164.83	182.73	218.27	
30				138.13	157.53	176.85	196.08	234.30	

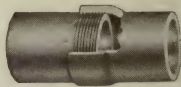
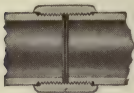
Large O. D. Pipe will be shipped in random lengths and plain ends unless otherwise ordered.  
For this pipe, fitted with threads and couplings, an extra charge will be made above regular.

For cut lengths, an extra charge will be made above random lengths.

For galvanized or asphalted pipe, an extra charge will be made above black.

We can thread pipe up to 24 inch inclusive, and can furnish wrought couplings up to 20 inch inclusive.

# WROUGHT WELL CASING



SCREW AND SOCKET JOINT

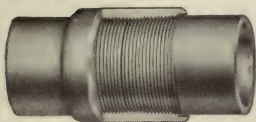
INSERTED JOINT

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	DIAMETERS		Thick- ness	WEIGHT PER FOOT		Threads per Inch	INSERTED JOINT	
	External	Internal		Plain Ends	Threads and Couplings		Length of Joint	Diameter of Joint
2	2.250	2.050	.100	2.296	2.34	14	.967	2.340
2 1/4	2.500	2.284	.108	2.759	2.82	14	.992	2.606
2 1/2	2.750	2.524	.113	3.182	3.25	14	1.017	2.866
2 3/4	3.000	2.768	.116	3.572	3.65	14	1.042	3.122
3	3.250	3.010	.120	4.011	4.10	14	1.067	3.380
3 1/4	3.500	3.250	.125	4.505	4.60	14	1.092	3.640
3 1/2	3.750	3.492	.129	4.988	5.10	14	1.117	3.898
3 3/4	4.000	3.732	.134	5.532	5.65	14	1.142	4.158
4	4.250	3.974	.138	6.060	6.20	14	1.167	4.416
4 1/4	4.500	4.216	.142	6.609	6.75	14	1.192	4.674
4 1/2	4.500	4.090	.205	9.403	9.50	14		
4 1/2	4.750	4.460	.145	7.131	7.25	14	1.217	4.930
4 1/2	4.750	4.364	.193	9.393	9.50	14		
4 3/4	5.000	4.696	.152	7.870	8.00	14	1.242	5.194
5	5.250	4.944	.153	8.328	8.50	14	1.267	5.446
5	5.250	4.886	.182	9.851	10.00	14		
5	5.250	4.886	.182	9.851	10.00	11 1/2		
5	5.250	4.768	.241	12.892	13.00	11 1/2		
5	5.250	4.648	.301	15.909	16.00	11 1/2		
5 3/8-16	5.500	5.192	.154	8.792	9.00	14	1.292	5.698
5 3/8-16	5.500	5.044	.228	12.837	13.00	11 1/2		
5 3/8-16	5.500	4.892	.304	16.870	17.00	11 1/2		
5 7/8	6.000	5.672	.164	10.222	10.50	14	1.342	6.218
5 7/8	6.000	5.620	.190	11.789	12.00	11 1/2		
5 7/8	6.000	5.552	.224	13.818	14.00	11 1/2		
5 7/8	6.000	5.450	.275	16.814	17.00	11 1/2		
6 1/4	6.625	6.287	.169	11.652	12.00	14	1.405	6.853
6 1/4	6.625	6.255	.185	12.724	13.00	14		
6 1/4	6.625	6.257	.184	12.657	13.00	11 1/2		
6 1/4	6.625	6.135	.245	16.694	17.00	11 1/2		
6 1/4	6.625	5.913	.356	23.835	24.00	11 1/2		
6 3/8	7.000	6.652	.174	12.685	13.00	14	1.442	7.238
6 3/8	7.000	6.538	.231	16.699	17.00	11 1/2		
6 3/8	7.000	6.538	.231	16.699	17.00	10		
6 3/8	7.000	6.450	.275	19.751	20.00	10		
6 3/8	7.000	6.334	.333	23.711	24.00	10		
7 1/4	7.625	7.263	.181	14.390	14.75	14	1.505	7.877
7 3/8	8.000	7.628	.186	15.522	16.00	11 1/2	1.573	8.238
7 3/8	8.000	7.528	.236	19.569	20.00	11 1/2		
8 1/4	8.625	8.249	.188	16.940	17.50	11 1/2	1.636	8.867
8 1/4	8.625	8.191	.217	19.486	20.00	11 1/2		
8 1/4	8.625	8.097	.264	23.574	24.00	11 1/2		
8 1/4	8.625	8.097	.264	23.574	24.00	8		
8 1/4	8.625	8.003	.311	27.615	28.00	8		
8 3/8	9.000	8.608	.196	18.429	19.00	11 1/2	1.673	9.258
9 3/8	10.000	9.582	.209	21.855	22.75	11 1/2	1.773	10.284
9 3/8	10.000	9.434	.283	29.369	30.25	11 1/2		
10	10.750	10.192	.279	31.201	32.51	8		
10	10.750	10.146	.302	33.699	35.00	8		
10 3/8	11.000	10.552	.224	25.780	26.75	11 1/2	1.873	11.314
11 3/8	12.000	11.514	.243	30.512	31.50	11 1/2	1.973	12.352
12 1/2	13.000	12.482	.259	35.243	36.50	11 1/2	2.073	13.384
12 1/2	13.000	12.278	.361	48.730	50.00	8		
13 1/2	14.000	13.448	.276	40.454	42.00	11 1/2	2.173	14.418
14 1/2	15.000	14.418	.291	45.714	47.50	11 1/2	2.273	15.448
15 1/2	16.000	15.396	.302	50.632	52.50	11 1/2	2.373	16.470

FOR LIST PRICES, SEE LATEST PIPE CARD

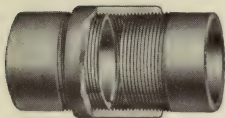
## ILLUSTRATIONS OF SPECIAL COUPLINGS AND JOINTS



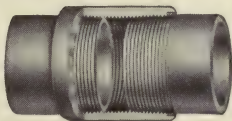
**DRIVE PIPE**



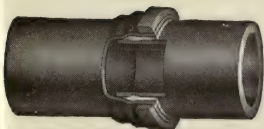
**FLUSH JOINT TUBING**



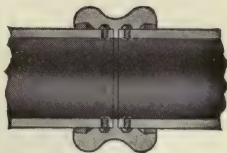
**LINE PIPE  
STANDARD**



**LINE PIPE  
EXTRA HEAVY**



**MATHESON LOCK JOINT**



**CONVERSE JOINT**

We are prepared to furnish wrought pipe equipped with screwed, shrunk, Cranelap or Craneweld flanges for Standard, Extra Heavy, or Hydraulic working pressures.

All of these flanges, with the exception of the Craneweld, can be made of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel, or Forged Steel. Craneweld flanges can be furnished only in Forged Steel.

See pages 382 to 386 for flanges.

## PIPE BENDS

### MADE FROM

### LAP WELDED PIPE

We have all the facilities for bending and finishing all sizes of pipe, and can furnish bends in Full Weight, Extra Strong or Double Extra Strong Wrought Pipe, equipped with screwed, shrunk, Cranelap or Cranweld Flanges in Standard, Extra Heavy or Hydraulic dimensions. These flanges can be made of Cast Iron, Ferrosteel, Malleable Iron, Cast Steel or Forged Steel, with one exception: Craneweld flanges can only be furnished in Forged Steel.

Where bends are used to take care of expansion and contraction movements, the flanges should be Extra Heavy Cast Steel or Forged Steel or Malleable Iron to provide sufficient strength for the strains.

The thickness of the wall of the pipe in a bend should be determined by the pressure under which the bend is to be operated and the diameter of the pipe. We will be pleased to give our recommendations for any particular service. The thicknesses given in the table below are the lightest we recommend and carry a sufficient safety factor, taking into consideration the scaling of pipe in the bending fire and thinning of wall due to stretching during the bending process.

#### THICKNESS OF PIPE FOR VARIOUS BENDS

##### UP TO 125 POUNDS WORKING PRESSURE

RADIUS	PIPE SIZE	PIPE
4 to 5 diameters.....	7 inches and smaller.....	Extra strong.
	8 inches and larger.....	$\frac{1}{2}$ inch thick.
Over 5 diameters.....	7 inches and smaller.....	Full weight.
	8 inches.....	28.55 pounds per foot.
	10 inches.....	40.48 pounds per foot.
	12 inches.....	49.56 pounds per foot.
	14 inches to 16 inches, inclusive.....	$\frac{5}{16}$ inch thick.
	18 inches to 22 inches, inclusive.....	$\frac{3}{8}$ inch thick.
	24 inches to 30 inches, inclusive.....	$\frac{7}{16}$ inch thick.

##### 125 POUNDS TO 250 POUNDS WORKING PRESSURE

4 to 5 and 6 diameters.....	7 inches and smaller.....	Extra strong.
	8 inches and larger.....	$\frac{1}{2}$ inch thick.
Over 6 diameters.....	7 inches and smaller.....	Full weight.
	8 inches.....	28.55 pounds per foot.
	10 inches.....	40.48 pounds per foot.
	12 inches.....	49.56 pounds per foot.
	14 inches to 16 inches, inclusive.....	$\frac{3}{8}$ inch thick.
	18 inches to 22 inches, inclusive.....	$\frac{7}{16}$ inch thick.
	24 inches to 30 inches, inclusive.....	$\frac{1}{2}$ inch thick.

##### 250 POUNDS TO 350 POUNDS WORKING PRESSURE

4 diameters and over.....	7 inches and smaller.....	Extra strong.
	8 inches and larger.....	$\frac{1}{2}$ inch thick.

(CONTINUED)



## PIPE BENDS—CONTINUED

By use of special machinery for threading and flanging, we are enabled to turn out work that is absolutely correct. A Crane bend is exact to the number of degrees ordered, and the flanges are made on at 90 degrees to the axis of the pipe in the tangent, so that it is not necessary to force the bend into place and bolt it up in the line under an angular strain.

Every bend is carefully tested under hydraulic pressure before shipment. In the table on page 632 we give the shortest recommended radii and tangents for different sizes of full weight and extra strong pipe; but wherever possible, these radii should be increased to allowable limits, as a short radius bend is not as flexible as one built with a longer radius. In addition it is more difficult to avoid buckles where the pipe is bent to a short radius. Five to six diameters of the pipe make a safe radius.

On pages 634 and 635, we show designs of pipe bends in common use, but our facilities do not confine us to the bends shown. We can make special bends conforming to any shape or dimensions to which it is practicable to bend pipe.

On page 637, we show a table giving the approximate length of pipe in quarter bends. The limit of this table is a random 20 foot length of pipe; however, it is possible to procure some sizes in 40 foot lengths and bends may be designed to come within these limits. Two or more lengths of pipe may be welded together to form bends.

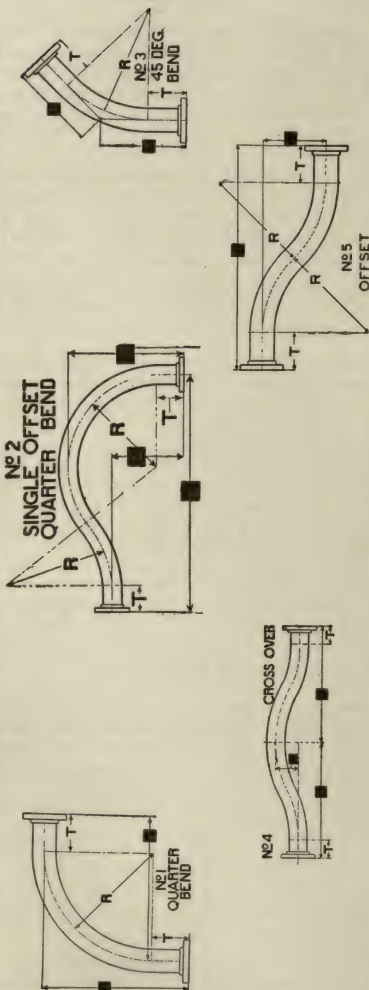
On page 636, we show a table giving the value of the various types of bends for taking care of expansion and contraction movements.

## SPECIFICATIONS FOR BENDS

A request for an estimate, or an order for bends should be accompanied by a sketch or blue-print showing all the necessary dimensions. In addition we should be furnished with information relative to the thickness of pipe desired in the bend and the type of flanges to be furnished.



## PIPE BENDS MADE FROM LAP WELDED STEEL PIPE



Size of Pipe.....	Inches	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
R—Minimum Advisable Radius of Bends . . . . .	Inches	12½	15	17½	20	22½	25	30	35	40	45	50	60	70	75	80	108	120	132	144
Shortest Radius to { *Standard Pipe..Inches	Inches	10	12	14	16	18	20	26	30	34	42	45	54	70	75	80	90	104	132	144
which Pipe can be bent { †Extra Strong Pipe...Inches	Inches	7	8	10	12	14	15	20	24	28	35	40	50	65	70	78	88	104	132	144
T—Minimum Length { Screwed and Shrink...Inches	Inches	4	4	5	5	6	6	7	8	9	11	12	14	16	16	18	18	18	18	18
of Tangent or { Craneweld.....Inches	Inches	—	5	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9
Straight Part of Bends { Cranelap.....Inches	Inches	—	6	6	6	6	7	7	8	8	9	10	10	10	14	14	16	18	20	20

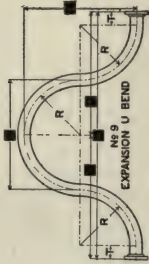
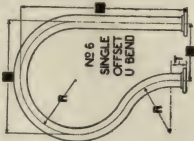
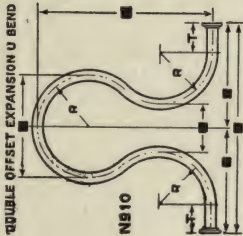
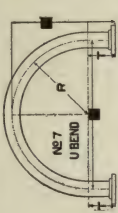
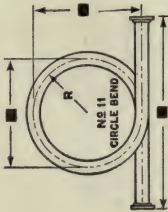
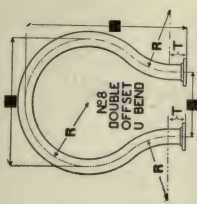
\*For 14 inch O. D. PIPE and larger having  $\frac{1}{8}$  inch or lighter metal.

†For 14 inch O. D. PIPE and larger having  $\frac{1}{2}$  inch or heavier metal.

Full dimension sketch or blue print, should accompany all inquiries or orders for Bends.

Drawings submitted, should include dimensions R, T, and dimensions marked ■ where necessary, and any other variations from dimensions as given in the above table.

EXPANSION PIPE BENDS MADE FROM LAP WELDED STEEL PIPE



Size of Pipe.....	Inches	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
R—Minimum Advisable Radius of Bends.....	Inches	12½	15	17½	20	22½	25	30	35	40	45	50	60	70	75	80	108	120	132	144
Shortest Radius to { *Standard Pipe.....	Inches	10	12	14	16	18	20	26	30	34	42	45	54	70	75	80	90	104	132	144
which Pipe can be bent { †Extra Strong Pipe.....	Inches	7	8	10	12	14	15	20	24	28	35	40	50	65	70	78	88	104	132	144
T—Minimum Length of Tangent or	Inches	4	4	5	5	6	6	7	8	9	11	12	14	16	18	18	18	18	18	18
Straight Part of Bends	Inches	—	5	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9	9
	Inches	—	6	6	6	6	7	7	8	8	9	10	10	14	14	16	18	18	20	20

\*For 14 inch O. D. PIPE and larger having  $\frac{7}{16}$  inch or lighter metal. †For 14 inch O. D. PIPE and larger having  $\frac{1}{2}$  inch or heavier metal.  
Full dimension sketch or blue print, should accompany all inquiries or orders for Bends.  
Drawings submitted, should include dimensions R, T, and dimensions marked ■ where necessary, and any other variations from dimensions as given in the above table.

## EXPANSION BENDS

### TABLE GIVING EXPANSION CARED FOR

Because of many inquiries and the necessity of having reliable data on the expansion value of pipe bends, Crane Co. made exhaustive and extensive tests on the various types of bends in several sizes and weights of pipe. The following figures giving in inches the expansion cared for by quarter bends are based on the results of these tests and are recommended as allowing a good safety factor.

Size of Pipe	Minimum Radius		RADIUS OF BENDS											
	Inches		Inches											
Inches	Standard Pipe	Extra Strong Pipe	20	30	40	50	60	70	80	90	100	110	120	
2½	10	7	¾	⅞	1½	2¼	3¼	4½	5⅞					
3	12	8	¾	1⅛	1⅜	1⅞	2¾	3⅝	4¾	6				
3½	14	10	⅝	⅞	1	1⅝	2⅝	3¼	4¼	5⅝				
4	16	12	¾	1½	1⅝	1⅞	2⅞	2⅞	3¾	4¾	5¾			
4½	18	14	¾	1⅞	⅞	1⅞	1⅞	2½	3⅝	4¼	5¼			
5	20	15		¾	¾	1⅞	1¾	2⅝	3	3⅞	4¾	5¾		
6	26	20		¾	⅝	1	1½	2	2½	3¼	4	4¾	5¾	
7	30	24			1⅞	⅞	1⅞	1¾	2¼	2⅞	3½	4¼	5¼	
8	34	28			1½	¾	1⅞	1½	2	2½	3	3¾	4⅝	
10	46	40				⅝	⅞	1¼	1½	2	2½	3	3½	
12	54	50				½	¾	1	1⅝	1⅞	2	2½	3	
14	70	65						⅞	1⅞	1½	1¾	2⅞	2½	

The above figures are for No. 1 Quarter Bends. See page 634.

For No. 7 "U" Bends multiply expansion values by 2.

For No. 6 Single Offset Bends or No. 9 Expansion "U" Bends multiply expansion values by 4.

For No. 10 Double Offset Bends or No. 11 Circle Bends multiply expansion values by 5.

THE EXPANSION SHOWN IN THE ABOVE TABLE DOES NOT TAKE INTO CONSIDERATION SPRINGING THE BEND WHEN BOLTING INTO PLACE.

WHEN BENDS ARE SPRUNG, A DISTANCE EQUAL TO THE FIGURE GIVEN IN THE ABOVE TABLE, THEY WILL TAKE CARE OF TWICE THAT FIGURE.

**APPROXIMATE LENGTH OF  
PIPE IN QUARTER BENDS  
EXCLUSIVE OF TANGENTS**

Radius Inches	Length Inches	Radius Inches	Length Inches	Radius Inches	Length Inches	Radius Inches	Length Inches
4	6 $\frac{1}{4}$	42	66	80	125 $\frac{3}{4}$	118	185 $\frac{1}{4}$
5	7 $\frac{3}{4}$	43	67 $\frac{1}{2}$	81	127 $\frac{1}{4}$	119	187
6	9 $\frac{1}{2}$	44	69 $\frac{1}{4}$	82	128 $\frac{3}{4}$	120	188 $\frac{1}{2}$
7	11	45	70 $\frac{3}{4}$	83	130 $\frac{1}{2}$	121	190
8	12 $\frac{1}{2}$	46	72 $\frac{1}{4}$	84	132	122	191 $\frac{1}{2}$
9	14 $\frac{1}{4}$	47	73 $\frac{3}{4}$	85	133 $\frac{1}{2}$	123	193 $\frac{1}{4}$
10	15 $\frac{3}{4}$	48	75 $\frac{1}{2}$	86	135	124	194 $\frac{3}{4}$
11	17 $\frac{1}{4}$	49	77	87	136 $\frac{3}{4}$	125	196 $\frac{1}{4}$
12	18 $\frac{3}{4}$	50	78 $\frac{1}{2}$	88	138 $\frac{1}{4}$	126	198
13	20 $\frac{1}{2}$	51	80	89	139 $\frac{3}{4}$	127	199 $\frac{1}{2}$
14	22	52	81 $\frac{3}{4}$	90	141 $\frac{1}{4}$	128	201
15	23 $\frac{1}{2}$	53	83 $\frac{1}{4}$	91	143	129	202 $\frac{3}{4}$
16	25 $\frac{1}{4}$	54	84 $\frac{3}{4}$	92	144 $\frac{1}{2}$	130	204 $\frac{1}{4}$
17	26 $\frac{3}{4}$	55	86 $\frac{1}{2}$	93	146	131	205 $\frac{3}{4}$
18	28 $\frac{1}{4}$	56	87 $\frac{1}{2}$	94	147 $\frac{3}{4}$	132	207 $\frac{1}{4}$
19	29 $\frac{3}{4}$	57	89 $\frac{1}{2}$	95	149 $\frac{1}{4}$	133	209
20	31 $\frac{1}{2}$	58	91	96	150 $\frac{3}{4}$	134	210 $\frac{1}{2}$
21	33	59	92 $\frac{3}{4}$	97	152 $\frac{1}{4}$	135	212
22	34 $\frac{1}{2}$	60	94 $\frac{1}{4}$	98	154	136	213 $\frac{3}{4}$
23	36 $\frac{1}{4}$	61	95 $\frac{3}{4}$	99	155 $\frac{1}{2}$	137	215 $\frac{1}{4}$
24	37 $\frac{3}{4}$	62	97 $\frac{1}{2}$	100	157	138	216 $\frac{3}{4}$
25	39 $\frac{1}{4}$	63	99	101	158 $\frac{3}{4}$	139	218 $\frac{1}{4}$
26	40 $\frac{3}{4}$	64	100 $\frac{1}{2}$	102	160 $\frac{1}{4}$	140	220
27	42 $\frac{1}{2}$	65	102	103	161 $\frac{3}{4}$	141	221 $\frac{1}{2}$
28	44	66	103 $\frac{3}{4}$	104	163 $\frac{1}{4}$	142	223
29	45 $\frac{1}{2}$	67	105 $\frac{1}{4}$	105	165	143	224 $\frac{3}{4}$
30	47 $\frac{1}{4}$	68	106 $\frac{3}{4}$	106	166 $\frac{1}{2}$	144	226 $\frac{1}{4}$
31	48 $\frac{3}{4}$	69	108 $\frac{1}{2}$	107	168	145	227 $\frac{3}{4}$
32	50 $\frac{1}{4}$	70	110	108	169 $\frac{3}{4}$	146	229 $\frac{1}{4}$
33	51 $\frac{3}{4}$	71	111 $\frac{1}{2}$	109	171 $\frac{1}{4}$	147	231
34	53 $\frac{1}{2}$	72	113	110	172 $\frac{3}{4}$	148	232 $\frac{1}{2}$
35	55	73	114 $\frac{1}{2}$	111	174 $\frac{1}{4}$	149	234
36	56 $\frac{1}{2}$	74	116 $\frac{1}{4}$	112	176	150	235 $\frac{1}{2}$
37	58 $\frac{1}{4}$	75	117 $\frac{3}{4}$	113	177 $\frac{1}{2}$	151	237 $\frac{1}{4}$
38	59 $\frac{3}{4}$	76	119 $\frac{1}{2}$	114	179	152	238 $\frac{3}{4}$
39	61 $\frac{1}{4}$	77	121	115	180 $\frac{3}{4}$	153	240 $\frac{1}{4}$
40	62 $\frac{3}{4}$	78	122 $\frac{1}{2}$	116	182 $\frac{1}{4}$	154	242
41	64 $\frac{1}{2}$	79	124	117	183 $\frac{3}{4}$	155	243 $\frac{1}{2}$

## EXPANSION OF STEAM PIPES

The linear expansion and contraction of pipe, due to differences of temperature of the fluid carried and the surrounding air, must be cared for by suitable expansion joints or bends.

In order to determine the amount of expansion or contraction in a pipe line, we give below a table showing the increase in length of a pipe 100 feet long at various temperatures.

The expansion for any length of pipe may be found by taking the difference in increased length at the minimum and maximum temperatures, dividing by 100 and multiplying by the length of the line under consideration.

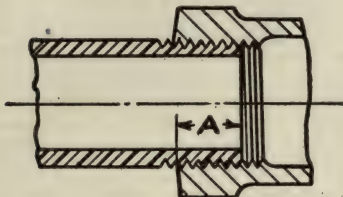
### EXPANSION OF PIPE INCREASE IN LENGTH—INCHES PER 100 FEET

Temperature, Degrees F.	Steel	Wrought Iron	Cast Iron	Brass and Copper
0	0	0	0	0
20	.15	.15	.10	.25
40	.30	.30	.25	.45
60	.45	.45	.40	.65
80	.60	.60	.55	.90
100	.75	.80	.70	1.15
20	.90	.95	.85	1.40
40	1.10	1.15	1.00	1.65
60	1.25	1.35	1.15	1.90
80	1.45	1.50	1.30	2.15
200	1.60	1.65	1.50	2.40
20	1.80	1.85	1.65	2.65
40	2.00	2.05	1.80	2.90
60	2.15	2.20	1.95	3.15
80	2.35	2.40	2.15	3.45
300	2.50	2.60	2.35	3.75
20	2.70	2.80	2.50	4.05
40	2.90	3.05	2.70	4.35
60	3.05	3.25	2.90	4.65
80	3.25	3.45	3.10	4.95
400	3.45	3.65	3.30	5.25
20	3.70	3.90	3.50	5.60
40	3.95	4.20	3.75	5.95
60	4.20	4.45	4.00	6.30
80	4.45	4.70	4.25	6.65
500	4.70	4.90	4.45	7.05
20	4.95	5.15	4.70	7.45
40	5.20	5.40	4.95	7.85
60	5.45	5.70	5.20	8.25
80	5.70	6.00	5.45	8.65
600	6.00	6.25	5.70	9.05
20	6.30	6.55	5.95	9.50
40	6.55	6.85	6.25	9.95
60	6.90	7.20	6.55	10.40
80	7.20	7.50	6.85	10.95
700	7.50	7.85	7.15	11.40
20	7.80	8.20	7.45	11.90
40	8.20	8.55	7.80	12.40
60	8.55	8.90	8.15	12.95
80	8.95	9.30	8.50	13.50
800	9.30	9.75	8.90	14.10



## LENGTH OF THREAD ON PIPE

THAT IS SCREWED INTO VALVES OR FITTINGS TO  
MAKE A TIGHT JOINT



Size Inches	Dimension A Inches	Size Inches	Dimension A Inches
$\frac{1}{8}$	$\frac{1}{4}$	$3\frac{1}{2}$	$1\frac{1}{16}$
$\frac{1}{4}$	$\frac{3}{8}$	4	$1\frac{1}{16}$
$\frac{3}{8}$	$\frac{3}{8}$	$4\frac{1}{2}$	$1\frac{1}{8}$
$\frac{1}{2}$	$\frac{1}{2}$	5	$1\frac{3}{16}$
$\frac{3}{4}$	$\frac{1}{2}$	6	$1\frac{1}{4}$
1	$\frac{9}{16}$	7	$1\frac{1}{4}$
$1\frac{1}{4}$	$\frac{5}{8}$	8	$1\frac{5}{16}$
$1\frac{1}{2}$	$\frac{5}{8}$	9	$1\frac{3}{8}$
2	$1\frac{1}{16}$	10	$1\frac{1}{2}$
$2\frac{1}{2}$	$1\frac{5}{16}$	12	$1\frac{5}{8}$
3	1		

DIMENSIONS GIVEN DO NOT ALLOW FOR VARIATION IN TAPPING  
OR THREADING

# STANDARD WROUGHT PIPE

## TABLE OF STANDARD DIMENSIONS

Size	DIAMETERS		Noml- nal Thick- ness Inches	CIRCUMFERENCE		TRANSVERSE AREAS			LENGTH OF PIPE PER SQUARE FOOT OF		Length of Pipe Con- taining One Cubic Foot Feet	NOMINAL WEIGHT PER FOOT		Number of Threads Per Inch of Screw
	Exter- nal Inches	Approx- imate Inter- nal Inches		Exter- nal Inches	Inter- nal Inches	Exter- nal Sq. Ins.	Inter- nal Sq. Ins.	Metal Sq. Ins.	Exter- nal Surface Feet	Inter- nal Surface Feet		Plain Ends	Threaded and Coupled	
Inches	Inches	Inches	Inches	Inches	Sq. Ins.	Sq. Ins.	Sq. Ins.	Feet	Feet	Feet	Feet			
1⁄8	.405	.269	.068	1.272	.845	.129	.057	.072	9.431	14.199	2533.775	.244	.245	27
1⁄4	.540	.364	.088	1.696	1.144	.229	.104	.125	7.073	10.493	1383.789	.424	.425	18
3⁄8	.675	.493	.091	2.121	1.549	.358	.191	.167	5.658	7.747	754.360	.567	.568	18
1⁄2	.840	.622	.109	2.639	1.954	.554	.304	.250	4.547	6.141	473.906	.850	.852	14
3⁄4	1.050	.824	.113	3.299	2.589	.866	.533	.333	3.637	4.635	270.034	1.130	1.134	14
1	1.315	1.049	.133	4.131	3.296	1.358	.864	.494	2.904	3.641	166.618	1.678	1.684	11½
1¼	1.660	1.380	.140	5.215	4.335	2.164	1.495	.669	2.301	2.767	96.275	2.272	2.281	11½
1½	1.900	1.610	.145	5.969	5.058	2.835	2.036	.799	2.010	2.372	70.733	2.717	2.731	11½
2	2.375	2.067	.154	7.461	6.494	4.430	3.355	1.075	1.608	1.847	42.913	3.652	3.678	11½
2½	2.875	2.469	.203	9.032	7.757	6.492	4.788	1.704	1.328	1.547	30.077	5.793	5.819	8
3	3.500	3.068	.216	10.996	9.638	9.621	7.393	2.228	1.091	1.245	19.479	7.575	7.616	8

CONTINUED FROM OPPOSITE PAGE

3½	4.000	3.548	.226	12.566	11.146	12.566	9.886	2.680	.954	1.076	14.565	9.109	9.202	8
4	4.500	4.026	.237	14.137	12.648	15.904	12.730	3.174	.848	.948	11.312	10.790	10.889	8
4½	5.000	4.506	.247	15.708	14.156	19.635	15.947	3.688	.763	.847	9.030	12.538	12.642	8
5	5.563	5.047	.258	17.477	15.856	24.306	20.006	4.300	.686	.756	7.198	14.617	14.810	8
6	6.625	6.065	.280	20.813	19.054	34.472	28.891	5.581	.576	.629	4.984	18.974	19.185	8
7	7.625	7.023	.301	23.955	22.063	45.664	38.738	6.926	.500	.543	3.717	23.544	23.769	8
8	8.625	8.071	.277	27.096	25.356	58.426	51.161	7.265	.442	.473	2.815	24.696	25.000	8
8	8.625	7.981	.322	27.096	25.073	58.426	50.027	8.399	.442	.478	2.878	28.554	28.809	8
9	9.625	8.941	.342	30.238	28.089	72.760	62.786	9.974	.396	.427	2.294	33.907	34.188	8
10	10.750	10.192	.279	33.772	32.019	90.763	81.585	9.178	.355	.374	1.765	31.201	32.000	8
10	10.750	10.136	.307	33.772	31.843	90.763	80.691	10.072	.355	.376	1.785	34.240	35.000	8
10	10.750	10.020	.365	33.772	31.479	90.763	78.855	11.908	.355	.381	1.826	40.483	41.132	8
11	11.750	11.000	.375	36.914	34.558	108.434	95.033	13.401	.325	.347	1.515	45.557	46.247	8
12	12.750	12.090	.330	40.055	37.982	127.676	114.800	12.876	.299	.315	1.254	43.773	45.000	8
12	12.750	12.000	.375	40.055	37.699	127.676	113.097	14.579	.299	.318	1.273	49.562	50.706	8

FOR LARGE O. D. PIPE, SEE PAGE 629

FOR LIST PRICES, SEE PAGE 628. FOR DESCRIPTION OF TESTS, SEE PAGE 625

# EXTRA STRONG WROUGHT PIPE

## TABLE OF STANDARD DIMENSIONS

DIAMETER			CIRCUMFERENCE		TRANSVERSE AREAS			LENGTH OF PIPE PER SQUARE FOOT OF		Length of Pipe Containing One Cubic Foot	Nominal Weight per Foot Plain Ends Pounds
Nominal Internal Diameter	External Diameter	Approximate Internal Diameter	External	Internal	External	Internal	Metal	External Surface	Internal Surface		
Inches	Inches	Inches	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Feet	Pounds
1/8	.405	.215	1.272	.675	.129	.036	.093	9.431	17.766	3966.392	.314
1/4	.540	.302	1.696	.949	.229	.072	.157	7.073	12.648	2010.290	.535
3/8	.675	.423	2.121	1.329	.358	.141	.217	5.658	9.030	1024.689	.738
1/2	.840	.546	2.639	1.715	.554	.234	.320	4.547	6.995	615.017	1.087
3/4	1.050	.742	3.299	2.331	.866	.433	.433	3.637	5.147	333.016	1.473
1	1.315	.957	4.131	3.007	1.358	.719	.639	2.904	3.991	200.193	2.171
1 1/4	1.660	1.278	5.215	4.015	2.164	1.283	.881	2.301	2.988	112.256	2.996
1 1/2	1.900	1.500	5.969	4.712	2.835	1.767	1.068	2.010	2.546	81.487	3.631
2	2.375	1.939	7.461	6.092	4.430	2.953	1.477	1.608	1.969	48.766	5.022
2 1/2	2.875	2.323	9.032	7.298	6.492	4.238	2.254	1.328	1.644	33.976	7.661
3	3.500	2.900	10.996	9.111	9.621	6.605	3.016	1.091	1.317	21.801	10.252
3 1/2	4.000	3.364	12.566	10.568	12.566	8.888	3.678	.954	1.135	16.202	12.505
4	4.500	3.826	14.137	12.020	15.904	11.497	4.407	.848	.998	12.525	14.983
4 1/2	5.000	4.290	15.708	13.477	19.635	14.455	5.180	.763	.890	9.962	17.611
5	5.563	4.813	17.477	15.120	24.306	18.194	6.112	.686	.793	7.915	20.778
6	6.625	5.761	20.813	18.099	34.472	26.067	8.405	.576	.663	5.524	28.573
7	7.625	6.625	23.955	20.813	45.664	34.472	11.192	.500	.576	4.177	38.048
8	8.625	7.625	27.096	23.955	58.426	45.663	12.763	.442	.500	3.154	43.388
9	9.625	8.625	30.238	27.096	72.760	58.426	14.334	.396	.442	2.464	48.728
10	10.750	9.750	33.772	30.631	90.763	74.662	16.101	.355	.391	1.929	54.735
11	11.750	10.750	36.914	33.772	108.434	90.763	17.671	.325	.355	1.587	60.075
12	12.750	11.750	40.055	36.914	127.676	108.434	19.242	.299	.325	1.328	65.415

FOR LIST PRICE, SEE PAGE 628 FOR DESCRIPTION OF TESTS, SEE PAGE 629

DOUBLE EXTRA STRONG WROUGHT PIPE

TABLE OF STANDARD DIMENSIONS

DIAMETER			Nominal Thickness Inches	CIRCUMFERENCE		TRANSVERSE AREAS			LENGTH OF PIPE PER SQUARE FOOT OF		Length of Pipe Con- taining One Cubic Foot	Nominal Weight per Foot Plain Ends  Pounds
Inches	External Inches	Approximate Internal Diameter Inches		External Inches	Internal Inches	External Sq. Inches	Internal Sq. Inches	Metal Sq. Inches	External Surface Feet	Internal Surface Feet		
1½	.840	.252	.294	2.639	.792	.554	.050	.504	4.547	15.157	2887.164	1.714
¾	1.050	.434	.308	3.299	1.363	.866	.148	.718	3.637	8.801	973.404	2.440
1	1.315	.599	.358	4.131	1.882	1.358	.282	1.076	2.904	6.376	510.998	3.659
1¼	1.660	.896	.382	5.215	2.815	2.164	.630	1.534	2.301	4.263	228.379	5.214
1½	1.900	1.100	.400	5.969	3.456	2.835	.950	1.885	2.010	3.472	151.526	6.408
2	2.375	1.503	.436	7.461	4.722	4.430	1.774	2.656	1.608	2.541	81.162	9.029
2½	2.875	1.771	.552	9.032	5.564	6.492	2.464	4.028	1.328	2.156	58.457	13.695
3	3.500	2.360	.600	10.996	7.226	9.621	4.155	5.466	1.091	1.660	34.659	18.583
3½	4.000	2.728	.636	12.566	8.570	12.566	5.845	6.721	.954	1.400	24.637	22.850
4	4.500	3.152	.674	14.137	9.902	15.904	7.803	8.101	.848	1.211	18.454	27.541
4½	5.000	3.580	.710	15.708	11.247	19.635	10.066	9.569	.763	1.066	14.306	32.530
5	5.563	4.063	.750	17.477	12.764	24.306	12.966	11.340	.686	.940	11.107	38.552
6	6.625	4.897	.864	20.813	15.384	34.472	18.835	15.637	.576	.786	7.646	53.160
7	7.625	5.875	.875	23.955	18.457	45.664	27.109	18.555	.500	.650	5.312	63.079
8	8.625	6.875	.875	27.096	21.598	58.426	37.122	21.304	.442	.555	3.879	72.424

Note.—Sizes 3 1/2 inch and larger are made by telescoping.

FOR LIST PRICES, SEE PAGE 628. FOR DESCRIPTION OF TESTS, SEE PAGE 625



## STANDARD BOILER TUBES

TABLE OF STANDARD DIMENSIONS

DIAMETER		Nominal Thickness Inches	Nearest B Wire Gauge No.	CIRCUMFERENCE		TRANSVERSE AREAS			LENGTH OF TUBE PER SQUARE FOOT OF		Nominal Weight per Foot Pounds
External Inches	Internal Inches			External Inches	Internal Inches	External Sq. Inches	Internal Sq. Inches	Metal Sq. Inches	External Surface Feet	Internal Surface Feet	
1 $\frac{3}{4}$	1.560	.095	13	5.498	4.901	2.405	1.911	.494	2.182	2.448	1.679
2	1.810	.095	13	6.283	5.686	3.142	2.573	.569	1.909	2.110	1.932
2 $\frac{1}{4}$	2.060	.095	13	7.069	6.472	3.976	3.333	.643	1.697	1.854	2.186
2 $\frac{1}{2}$	2.282	.109	12	7.854	7.169	4.909	4.090	.819	1.527	1.673	2.783
2 $\frac{3}{4}$	2.532	.109	12	8.639	7.955	5.940	5.036	.904	1.388	1.508	3.074
3	2.782	.109	12	9.425	8.740	7.069	6.079	.990	1.273	1.373	3.365
3 $\frac{1}{4}$	3.010	.120	11	10.210	9.456	8.296	7.116	1.180	1.175	1.269	4.011
3 $\frac{1}{2}$	3.260	.120	11	10.996	10.242	9.621	8.347	1.274	1.091	1.171	4.331
3 $\frac{3}{4}$	3.510	.120	11	11.781	11.027	11.045	9.677	1.368	1.018	1.088	4.652
4	3.732	.134	10	12.566	11.724	12.566	10.939	1.627	.954	1.023	5.532
4 $\frac{1}{2}$	4.232	.134	10	14.137	13.295	15.904	14.066	1.838	.848	.902	6.248
5	4.704	.148	9	15.708	14.778	19.635	17.379	2.256	.763	.812	7.669

CONTINUED ON FOLLOWING PAGE

# STANDARD BOILER TUBES—CONTINUED

## TABLE OF STANDARD DIMENSIONS

DIAMETER		Nominal Thickness	Nearest B Wire Gauge	CIRCUMFERENCE		TRANSVERSE AREAS			LENGTH OF TUBE PER SQUARE FOOT OF		Nominal Weight per Foot
External	Internal			External	Internal	External	Internal	Metal	External Surface	Internal Surface	
Inches	Inches	Inches	No.	Inches	Inches	Sq. Inches	Sq. Inches	Sq. Inches	Feet	Feet	Pounds
6	5.670	.165	8	18.850	17.813	28.274	25.249	3.025	.636	.673	10.282
7	6.670	.165	8	21.991	20.954	38.485	34.942	3.543	.545	.572	12.044
8	7.670	.165	8	25.133	24.096	50.265	46.204	4.061	.477	.498	13.807
9	8.640	.180	7	28.274	27.143	63.617	58.629	4.988	.424	.442	16.955
10	9.594	.203	6	31.416	30.140	78.540	72.292	6.248	.381	.398	21.240
11	10.560	.220	5	34.558	33.175	95.033	87.582	7.451	.347	.361	25.329
12	11.542	.229	—	37.699	36.260	113.097	104.629	8.468	.318	.330	28.788
13	12.524	.238	4	40.840	39.345	132.732	123.190	9.542	.293	.304	32.439

NOTE.—In estimating effective steam-heating or evaporating surface of tubes, the surface in contact with air or gases of combustion, according to manner of application, as whether internal or external, is to be thus taken. For heating liquids by steam, superheating steam, or transferring heat from one liquid or one gas to another, mean surface of tubes to be computed.

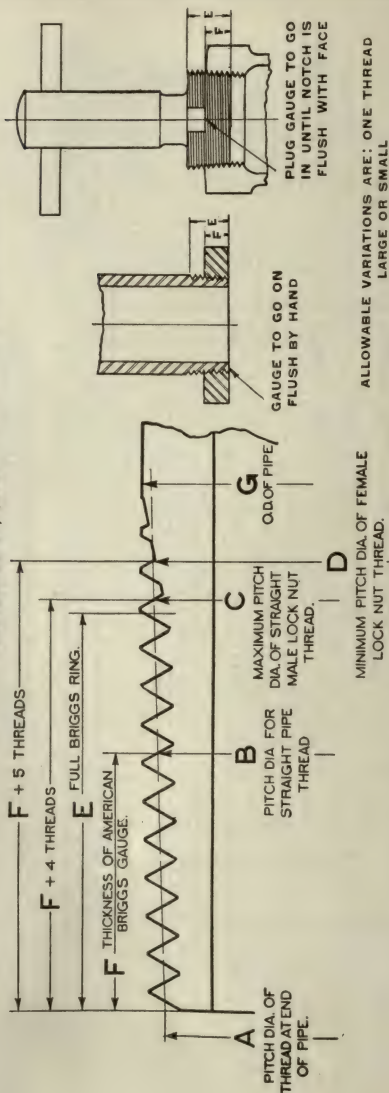
FOR LIST ON BOILER TUBES, SEE LATEST PIPE CARD  
FOR LOCOMOTIVE TUBES, SUBMIT SPECIFICATIONS

Boiler Tubes to conform to the A. S. M. E. Boiler Code must be so ordered.  
Most boiler tubes are now made to conform to the A. S. M. E. Boiler Code, which requires that the gauge ordered is the lightest that can be furnished, so that tubes made to this specification will average heavier and of smaller internal diameter than given above.

# AMERICAN BRIGGS STANDARD FOR TAPER AND STRAIGHT PIPE THREADS AND LOCK-NUT THREADS

ADOPTED BY THE COMMITTEE OF MANUFACTURERS ON STANDARDIZATION OF FITTINGS AND VALVES AND THE AMERICAN SOCIETY OF AMERICAN ENGINEERS

SEPTEMBER 17, 1913



$$A \text{ equals } G - (0.05G + 1.9) \times \frac{1}{N} + \frac{0.8}{N}$$

$$B \text{ equals } A + (F \times .0625)$$

$$C \text{ equals } B + \left( \frac{4}{N} \times .0625 \right)$$

$$D \text{ equals } B + \left( \frac{5}{N} \times .0625 \right)$$

$$E \text{ equals } (0.8G + 4.8) \times \frac{1}{N} + \frac{2}{N}$$

F equals American Briggs Standard.

N equals Number of threads per inch.  
Total Taper  $\frac{3}{4}$  inch per foot.

Depth of Thread  $\frac{0.8}{N}$

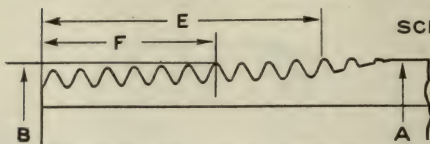
# AMERICAN BRIGGS STANDARD PIPE THREADS

(CONTINUED)

Size	A	B	C	D	E	F	G	Depth of Thread	Threads per Inch
1/8	.36350	.37475	.38400	.38632	.2638	.180	.405	.02962	27
1/4	.47739	.48989	.50378	.50725	.4018	.200	.540	.04444	18
3/8	.61201	.62701	.64090	.64437	.4078	.240	.675	.04444	18
1/2	.75843	.77843	.79628	.80075	.5337	.320	.840	.05714	14
3/4	.96768	.98886	1.00671	1.01118	.5457	.339	1.050	.05714	14
1	1.21363	1.23863	1.26036	1.26580	.6828	.400	1.315	.06956	11 1/2
1 1/4	1.55713	1.58338	1.60511	1.61055	.7068	.420	1.660	.06956	11 1/2
1 1/2	1.79609	1.82234	1.84407	1.84951	.7235	.420	1.900	.06956	11 1/2
2	2.26902	2.29627	2.31801	2.32344	.7565	.436	2.375	.06956	11 1/2
2 1/2	2.71954	2.76216	2.79341	2.80122	1.1375	.682	2.875	1.00	8
3	3.34063	3.38850	3.41975	3.42756	1.2000	.706	3.500	1.00	8
3 1/2	3.83750	3.88881	3.92006	3.92787	1.2500	.821	4.000	1.00	8
4	4.33438	4.38713	4.41838	4.42619	1.3000	.844	4.500	1.00	8
4 1/2	4.83125	4.88593	4.91718	4.92499	1.3500	.875	5.000	1.00	8
5	5.39074	5.44930	5.48055	5.48836	1.4063	.937	5.563	1.00	8
6	6.44610	6.50597	6.53722	6.54503	1.5125	.958	6.625	1.00	8
7	7.43985	7.50235	7.53360	7.54141	1.6125	1.000	7.625	1.00	8
8	8.43360	8.50003	8.53128	8.53909	1.7125	1.063	8.625	1.00	8
9	9.42735	9.49797	9.52922	9.53703	1.8125	1.130	9.625	1.00	8
10	10.54532	10.62094	10.65219	10.66000	1.9250	1.21	10.750	1.00	8
11	11.53907	11.61938	11.65063	11.65844	2.0250	1.285	11.750	1.00	8
12	12.53282	12.61782	12.64907	12.65688	2.1250	1.360	12.750	1.00	8
14 O. D.	13.7750	13.87202	13.90387	13.91168	2.250	1.562	14.00	1.00	8
15 O. D.	14.76875	14.87418	14.90543	14.91324	2.350	1.687	15.00	1.00	8
16 O. D.	15.76250	15.87575	15.90700	15.91481	2.450	1.812	16.00	1.00	8
17 O. D.	16.75625	16.87500	16.90625	16.91406	2.550	1.900	17.00	1.00	8
18 O. D.	17.7500	17.87500	17.90625	17.91406	2.650	2.000	18.00	1.00	8
20 O. D.	19.73750	19.87031	19.90156	19.90937	2.850	2.125	20.00	1.00	8
22 O. D.	21.72500	21.86562	21.89687	21.90468	3.050	2.250	22.00	1.00	8
24 O. D.	23.71250	23.86093	23.89218	23.89999	3.250	2.375	24.00	1.00	8

Crane Company's threading of Fittings and Valves corresponds to the above dimensions and standards.

## BRITISH STANDARD PIPE THREADS



## SCHEDULE OF SIZES

Whitworth  
55° Form of  
Thread.

Total taper  
 $\frac{3}{4}$  inch per foot.

Nominal Bore of Pipe  Inches	A  Approximate Outside Diameter of Pipe Inches	B  Gauge Diameter Top of Thread Inches	Single Depth of Thread  Inches	Number of Threads Per Inch	E  Length of Thread on Pipe End Inches	F  Distance of Gauge Diameter from End of Pipe Inches
$\frac{1}{8}$	$\frac{13}{32}$	.383	.0230	28	$\frac{3}{8}$	$\frac{5}{32}$
$\frac{1}{4}$	$\frac{17}{32}$	.518	.0335	19	$\frac{7}{16}$	$\frac{3}{16}$
$\frac{3}{8}$	$\frac{11}{16}$	.656	.0335	19	$\frac{1}{2}$	$\frac{1}{4}$
$\frac{1}{2}$	$\frac{27}{32}$	.825	.0455	14	$\frac{5}{8}$	$\frac{1}{4}$
$\frac{5}{8}$	$\frac{15}{16}$	.902	.0455	14	$\frac{5}{8}$	$\frac{1}{4}$
$\frac{3}{4}$	$1\frac{1}{16}$	1.041	.0455	14	$\frac{3}{4}$	$\frac{3}{8}$
$\frac{7}{8}$	$1\frac{7}{32}$	1.189	.0455	14	$\frac{3}{4}$	$\frac{3}{8}$
1	$1\frac{1}{2}$	1.309	.0580	11	$\frac{7}{8}$	$\frac{3}{8}$
$1\frac{1}{4}$	$1\frac{11}{16}$	1.650	.0580	11	1	$\frac{1}{2}$
$1\frac{1}{2}$	$1\frac{23}{32}$	1.882	.0580	11	1	$\frac{1}{2}$
$1\frac{3}{4}$	$2\frac{1}{32}$	2.116	.0580	11	$1\frac{1}{8}$	$\frac{5}{8}$
2	$2\frac{3}{8}$	2.347	.0580	11	$1\frac{1}{8}$	$\frac{5}{8}$
$2\frac{1}{4}$	$2\frac{5}{8}$	2.587	.0580	11	$1\frac{1}{4}$	$\frac{11}{16}$
$2\frac{1}{2}$	3	2.960	.0580	11	$1\frac{1}{4}$	$\frac{11}{16}$
$2\frac{3}{4}$	$3\frac{1}{4}$	3.210	.0580	11	$1\frac{3}{8}$	$\frac{13}{16}$
3	$3\frac{1}{2}$	3.460	.0580	11	$1\frac{3}{8}$	$\frac{13}{16}$
$3\frac{1}{4}$	$3\frac{3}{4}$	3.700	.0580	11	$1\frac{1}{2}$	$\frac{7}{8}$
$3\frac{1}{2}$	4	3.950	.0580	11	$1\frac{1}{2}$	$\frac{7}{8}$
$3\frac{3}{4}$	$4\frac{1}{4}$	4.200	.0580	11	$1\frac{1}{2}$	$\frac{7}{8}$
4	$4\frac{1}{2}$	4.450	.0580	11	$1\frac{5}{8}$	1
$4\frac{1}{2}$	5	4.950	.0580	11	$1\frac{5}{8}$	1
5	$5\frac{1}{2}$	5.450	.0580	11	$1\frac{3}{4}$	$1\frac{1}{8}$
$5\frac{1}{2}$	6	5.950	.0580	11	$1\frac{7}{8}$	$1\frac{1}{4}$
6	$6\frac{1}{2}$	6.450	.0580	11	2	$1\frac{3}{8}$
7	$7\frac{1}{2}$	7.450	.0640	10	$2\frac{1}{8}$	$1\frac{3}{8}$
8	$8\frac{1}{2}$	8.450	.0640	10	$2\frac{1}{4}$	$1\frac{1}{2}$
9	$9\frac{1}{2}$	9.450	.0640	10	$2\frac{1}{4}$	$1\frac{1}{2}$
10	$10\frac{1}{2}$	10.450	.0640	10	$2\frac{3}{8}$	$1\frac{5}{8}$
11	$11\frac{1}{2}$	11.450	.0800	8	$2\frac{1}{2}$	$1\frac{5}{8}$
12	$12\frac{1}{2}$	12.450	.0800	8	$2\frac{1}{2}$	$1\frac{5}{8}$
13	$13\frac{3}{4}$	13.680	.0800	8	$2\frac{5}{8}$	$1\frac{5}{8}$
14	$14\frac{3}{4}$	14.680	.0800	8	$2\frac{3}{4}$	$1\frac{3}{4}$
15	$15\frac{3}{4}$	15.680	.0800	8	$2\frac{3}{4}$	$1\frac{3}{4}$
16	$16\frac{3}{4}$	16.680	.0800	8	$2\frac{7}{8}$	$1\frac{7}{8}$
17	$17\frac{3}{4}$	17.680	.0800	8	3	2
18	$18\frac{3}{4}$	18.680	.0800	8	3	2



# TEMPLATES FOR DRILLING BRASS FLANGED VALVES AND FITTINGS (1914 BRASS STANDARD)

## "HEAVY" FOR PRESSURES UP TO 150 POUNDS

Size Inches	Diameter of Flange Inches	Thickness of Flange Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches
$\frac{1}{4}$ and $\frac{3}{8}$	$2\frac{1}{2}$	$\frac{9}{32}$	$1\frac{11}{16}$	4	$\frac{3}{8}$	1
$\frac{1}{2}$	3	$\frac{5}{16}$	$2\frac{1}{8}$	4	$\frac{3}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	$3\frac{1}{2}$	$\frac{11}{32}$	$2\frac{1}{2}$	4	$\frac{3}{8}$	$1\frac{1}{4}$
1	4	$\frac{3}{8}$	3	4	$\frac{7}{16}$	$1\frac{1}{4}$
$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{13}{32}$	$3\frac{3}{8}$	4	$\frac{7}{16}$	$1\frac{1}{2}$
$1\frac{1}{2}$	5	$\frac{7}{16}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$1\frac{1}{2}$
2	6	$\frac{1}{2}$	$4\frac{3}{4}$	4	$\frac{5}{8}$	$1\frac{3}{4}$
$2\frac{1}{2}$	7	$\frac{9}{16}$	$5\frac{1}{2}$	4	$\frac{5}{8}$	2
3	$7\frac{1}{2}$	$\frac{5}{8}$	6	4	$\frac{5}{8}$	2
$3\frac{1}{2}$	$8\frac{1}{2}$	$\frac{11}{16}$	7	4	$\frac{5}{8}$	$2\frac{1}{4}$
4	9	$\frac{11}{16}$	$7\frac{1}{2}$	8	$\frac{5}{8}$	$2\frac{1}{4}$
$4\frac{1}{2}$	$9\frac{1}{4}$	$\frac{33}{64}$	$7\frac{3}{4}$	8	$\frac{3}{4}$	$2\frac{1}{2}$
5	10	$\frac{3}{4}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	$2\frac{1}{2}$
6	11	$\frac{13}{16}$	$9\frac{1}{2}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
7	$12\frac{1}{2}$	$\frac{7}{8}$	$10\frac{3}{4}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
8	$13\frac{1}{2}$	$\frac{15}{16}$	$11\frac{3}{4}$	8	$\frac{3}{4}$	3
9	15	$\frac{15}{16}$	$13\frac{1}{4}$	12	$\frac{3}{4}$	3
10	16	1	$14\frac{1}{4}$	12	$\frac{7}{8}$	$3\frac{1}{4}$
12	19	$1\frac{1}{16}$	17	12	$\frac{7}{8}$	$3\frac{1}{4}$

## "EXTRA HEAVY" FOR PRESSURES UP TO 250 POUNDS

Size Inches	Diameter of Flange Inches	Thickness of Flange Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches
$\frac{1}{4}$ and $\frac{3}{8}$	3	$\frac{3}{8}$	2	4	$\frac{7}{16}$	$1\frac{1}{4}$
$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{13}{32}$	$2\frac{3}{8}$	4	$\frac{7}{16}$	$1\frac{1}{2}$
$\frac{3}{4}$	4	$\frac{7}{16}$	$2\frac{7}{8}$	4	$\frac{1}{2}$	$1\frac{1}{2}$
1	$4\frac{1}{2}$	$\frac{1}{2}$	$3\frac{1}{4}$	4	$\frac{1}{2}$	$1\frac{3}{4}$
$1\frac{1}{4}$	5	$\frac{17}{32}$	$3\frac{3}{4}$	4	$\frac{1}{2}$	$1\frac{3}{4}$
$1\frac{1}{2}$	6	$\frac{9}{16}$	$4\frac{1}{2}$	4	$\frac{5}{8}$	2
2	$6\frac{1}{2}$	$\frac{5}{8}$	5	4	$\frac{5}{8}$	2
$2\frac{1}{2}$	$7\frac{1}{2}$	$\frac{11}{16}$	$5\frac{7}{8}$	4	$\frac{3}{4}$	$2\frac{1}{4}$
3	$8\frac{1}{4}$	$\frac{3}{4}$	$6\frac{5}{8}$	8	$\frac{3}{4}$	$2\frac{1}{2}$
$3\frac{1}{2}$	9	$\frac{13}{16}$	$7\frac{1}{4}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
4	10	$\frac{7}{8}$	$7\frac{7}{8}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
$4\frac{1}{2}$	$10\frac{1}{2}$	$\frac{7}{8}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
5	11	$\frac{15}{16}$	$9\frac{1}{4}$	8	$\frac{3}{4}$	3
6	$12\frac{1}{2}$	1	$10\frac{3}{8}$	12	$\frac{3}{4}$	3
7	14	$1\frac{1}{16}$	$11\frac{7}{8}$	12	$\frac{7}{8}$	$3\frac{1}{4}$
8	15	$1\frac{1}{8}$	13	12	$\frac{7}{8}$	$3\frac{1}{2}$
9	$16\frac{1}{4}$	$1\frac{1}{8}$	14	12	1	$3\frac{1}{2}$
10	$17\frac{1}{2}$	$1\frac{3}{8}$	$15\frac{1}{4}$	16	1	$3\frac{3}{4}$
12	$20\frac{1}{2}$	$1\frac{1}{4}$	$17\frac{3}{4}$	16	$1\frac{1}{8}$	4

Bolt Holes drilled  $\frac{1}{16}$  inch larger than bolt diameter, 2 inch size and smaller and  $\frac{1}{8}$  inch larger for  $2\frac{1}{2}$  inch size and larger. "Heavy" and "Extra Heavy" flanges to have plain smooth faces. Full Faced Gaskets should be used. When bolted to Extra Heavy iron flanges, valves or fittings, the latter should be ordered with plain faces. Diameters given are finished dimensions.

# **TEMPLATES FOR DRILLING STANDARD AND LOW PRESSURE FLANGED VALVES AND FITTINGS**

## **AMERICAN STANDARD**

EFFECTIVE JANUARY 1, 1914

Size	Diameter of Flanges	Thickness of Flanges	Bolt Circle	Number of Bolts	Size of Bolts	Length of Bolts	Length of Studs with 2 Nuts
Inches	Inches	Inches	Inches		Inches	Inches	Inches
1	4	$\frac{7}{16}$	3	4	$\frac{7}{16}$	$1\frac{1}{2}$	
$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{1}{2}$	$3\frac{3}{8}$	4	$\frac{7}{16}$	$1\frac{1}{2}$	
$1\frac{1}{2}$	5	$\frac{9}{16}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$1\frac{3}{4}$	
2	6	$\frac{5}{8}$	$4\frac{3}{4}$	4	$\frac{5}{8}$	2	
$2\frac{1}{2}$	7	$\frac{11}{16}$	$5\frac{1}{2}$	4	$\frac{5}{8}$	$2\frac{1}{4}$	
3	$7\frac{1}{2}$	$\frac{3}{4}$	6	4	$\frac{5}{8}$	$2\frac{1}{4}$	
$3\frac{1}{2}$	$8\frac{1}{2}$	$\frac{13}{16}$	7	4	$\frac{5}{8}$	$2\frac{1}{2}$	
4	9	$\frac{15}{16}$	$7\frac{1}{2}$	8	$\frac{5}{8}$	$2\frac{3}{4}$	
$4\frac{1}{2}$	$9\frac{1}{4}$	$\frac{15}{16}$	$7\frac{3}{4}$	8	$\frac{3}{4}$	$2\frac{3}{4}$	
5	10	$\frac{15}{16}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	$2\frac{3}{4}$	
6	11	1	$9\frac{1}{2}$	8	$\frac{3}{4}$	3	
7	$12\frac{1}{2}$	$1\frac{1}{16}$	$10\frac{3}{4}$	8	$\frac{3}{4}$	3	
8	$13\frac{1}{2}$	$1\frac{1}{8}$	$11\frac{3}{4}$	8	$\frac{3}{4}$	$3\frac{1}{4}$	
9	15	$1\frac{1}{8}$	$13\frac{1}{4}$	12	$\frac{3}{4}$	$3\frac{1}{4}$	
10	16	$1\frac{3}{16}$	$14\frac{1}{4}$	12	$\frac{7}{8}$	$3\frac{1}{2}$	
12	19	$1\frac{1}{4}$	17	12	$\frac{7}{8}$	$3\frac{1}{2}$	
14	21	$1\frac{3}{8}$	$18\frac{3}{4}$	12	1	4	
15	$22\frac{1}{4}$	$1\frac{3}{8}$	20	16	1	4	
16	$23\frac{1}{2}$	$1\frac{7}{16}$	$21\frac{1}{4}$	16	1	4	
18	25	$1\frac{9}{16}$	$22\frac{3}{4}$	16	$1\frac{1}{8}$	$4\frac{1}{2}$	
20	$27\frac{1}{2}$	$1\frac{11}{16}$	25	20	$1\frac{1}{8}$	$4\frac{3}{4}$	
22	$29\frac{1}{2}$	$1\frac{13}{16}$	$27\frac{1}{4}$	20	$1\frac{1}{4}$	5	
24	32	$1\frac{7}{8}$	$29\frac{1}{2}$	20	$1\frac{1}{4}$	$5\frac{1}{4}$	
26	$34\frac{1}{4}$	2	$31\frac{3}{4}$	24	$1\frac{1}{4}$	$5\frac{1}{2}$	
28	$36\frac{1}{2}$	$2\frac{1}{16}$	34	28	$1\frac{1}{4}$	$5\frac{1}{2}$	
30	$38\frac{3}{4}$	$2\frac{1}{8}$	36	28	$1\frac{3}{8}$	$5\frac{3}{4}$	
32	$41\frac{3}{4}$	$2\frac{1}{4}$	$38\frac{1}{2}$	28	$1\frac{1}{2}$	$6\frac{1}{4}$	
34	$43\frac{3}{4}$	$2\frac{5}{16}$	$40\frac{1}{2}$	32	$1\frac{1}{2}$	$6\frac{1}{2}$	
36	46	$2\frac{3}{8}$	$42\frac{3}{4}$	32	$1\frac{1}{2}$	$6\frac{1}{2}$	
38	$48\frac{3}{4}$	$2\frac{3}{8}$	$45\frac{1}{4}$	32	$1\frac{5}{8}$	$6\frac{3}{4}$	9
40	$50\frac{3}{4}$	$2\frac{1}{2}$	$47\frac{1}{4}$	36	$1\frac{5}{8}$	7	9

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled  $\frac{1}{8}$  inch larger than nominal diameter of bolts

# **TEMPLATES FOR DRILLING** **STANDARD AND LOW PRESSURE** **FLANGED VALVES AND FITTINGS**

## **AMERICAN STANDARD**

EFFECTIVE JANUARY 1, 1914

CONTINUED

Size	Diameter of Flanges	Thickness of Flanges	Bolt Circle	Number of Bolts	Size of Bolts	Length of Bolts	Length of Studs with 2 Nuts
Inches	Inches	Inches	Inches		Inches	Inches	Inches
42	53	2 $\frac{5}{8}$	49 $\frac{1}{2}$	36	1 $\frac{5}{8}$	7 $\frac{1}{4}$	9 $\frac{1}{2}$
44	55 $\frac{1}{4}$	2 $\frac{5}{8}$	51 $\frac{3}{4}$	40	1 $\frac{5}{8}$	7 $\frac{1}{4}$	9 $\frac{1}{2}$
46	57 $\frac{1}{4}$	2 $\frac{1}{2}$	53 $\frac{3}{4}$	40	1 $\frac{5}{8}$	7 $\frac{1}{2}$	9 $\frac{1}{2}$
48	59 $\frac{1}{2}$	2 $\frac{3}{4}$	56	44	1 $\frac{5}{8}$	7 $\frac{1}{2}$	9 $\frac{1}{2}$
50	61 $\frac{3}{4}$	2 $\frac{3}{4}$	58 $\frac{1}{4}$	44	1 $\frac{3}{4}$	7 $\frac{3}{4}$	10
52	64	2 $\frac{7}{8}$	60 $\frac{1}{2}$	44	1 $\frac{3}{4}$	8	10 $\frac{1}{2}$
54	66 $\frac{1}{4}$	3	62 $\frac{3}{4}$	44	1 $\frac{3}{4}$	8 $\frac{1}{4}$	10 $\frac{1}{2}$
56	68 $\frac{3}{4}$	3	65	48	1 $\frac{3}{4}$	8 $\frac{1}{4}$	10 $\frac{1}{2}$
58	71	3 $\frac{1}{8}$	67 $\frac{1}{4}$	48	1 $\frac{3}{4}$	8 $\frac{1}{2}$	11
60	73	3 $\frac{1}{8}$	69 $\frac{1}{4}$	52	1 $\frac{3}{4}$	8 $\frac{1}{2}$	11
62	75 $\frac{3}{4}$	3 $\frac{1}{4}$	71 $\frac{3}{4}$	52	1 $\frac{7}{8}$	9	11 $\frac{1}{2}$
64	78	3 $\frac{1}{4}$	74	52	1 $\frac{7}{8}$	9	11 $\frac{1}{2}$
66	80	3 $\frac{3}{8}$	76	52	1 $\frac{7}{8}$	9 $\frac{1}{4}$	11 $\frac{1}{2}$
68	82 $\frac{1}{4}$	3 $\frac{3}{8}$	78 $\frac{1}{4}$	56	1 $\frac{7}{8}$	9 $\frac{1}{4}$	11 $\frac{1}{2}$
70	84 $\frac{1}{2}$	3 $\frac{1}{2}$	80 $\frac{1}{2}$	56	1 $\frac{7}{8}$	9 $\frac{1}{2}$	12
72	86 $\frac{1}{2}$	3 $\frac{1}{2}$	82 $\frac{1}{2}$	60	1 $\frac{7}{8}$	9 $\frac{1}{2}$	12
74	88 $\frac{1}{2}$	3 $\frac{3}{8}$	84 $\frac{1}{2}$	60	1 $\frac{7}{8}$	9 $\frac{3}{4}$	12
76	90 $\frac{3}{4}$	3 $\frac{3}{8}$	86 $\frac{1}{2}$	60	1 $\frac{7}{8}$	9 $\frac{3}{4}$	12
78	93	3 $\frac{3}{4}$	88 $\frac{3}{4}$	60	2	10	12 $\frac{1}{2}$
80	95 $\frac{1}{4}$	3 $\frac{3}{4}$	91	60	2	10	12 $\frac{1}{2}$
82	97 $\frac{1}{2}$	3 $\frac{7}{8}$	93 $\frac{1}{4}$	60	2	10 $\frac{1}{2}$	13
84	99 $\frac{3}{4}$	3 $\frac{7}{8}$	95 $\frac{1}{2}$	64	2	10 $\frac{1}{2}$	13
86	102	4	97 $\frac{3}{4}$	64	2	10 $\frac{1}{2}$	13
88	104 $\frac{1}{4}$	4	100	68	2	10 $\frac{1}{2}$	13
90	106 $\frac{1}{2}$	4 $\frac{1}{8}$	102 $\frac{1}{4}$	68	2 $\frac{1}{8}$	11	14
92	108 $\frac{3}{4}$	4 $\frac{1}{8}$	104 $\frac{1}{2}$	68	2 $\frac{1}{8}$	11	14
94	111	4 $\frac{1}{4}$	106 $\frac{1}{4}$	68	2 $\frac{1}{8}$	11 $\frac{1}{4}$	14
96	113 $\frac{1}{4}$	4 $\frac{1}{4}$	108 $\frac{1}{2}$	68	2 $\frac{1}{4}$	11 $\frac{1}{2}$	14 $\frac{1}{2}$
98	115 $\frac{1}{2}$	4 $\frac{3}{8}$	110 $\frac{3}{4}$	68	2 $\frac{1}{4}$	11 $\frac{1}{2}$	14 $\frac{1}{2}$
100	117 $\frac{3}{4}$	4 $\frac{3}{8}$	113	68	2 $\frac{1}{4}$	11 $\frac{1}{2}$	14 $\frac{1}{2}$

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled  $\frac{1}{8}$  inch larger than nominal diameter of bolts.

# **TEMPLATES FOR DRILLING EXTRA HEAVY AND MEDIUM FLANGED VALVES AND EXTRA HEAVY FLANGED FITTINGS**

**AMERICAN STANDARD  
EFFECTIVE JANUARY 1, 1914**

Size Inches	Diameter of Flanges Inches	Thickness of Flanges Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches	Length of Studs with 2 Nuts Inches
1	4½	1⅛	3¼	4	½	2	
1¼	5	¾	3¾	4	½	2¼	
1½	6	1⅜	4½	4	⅝	2½	
2	6½	⅞	5	4	⅝	2½	
2½	7½	1	5⅞	4	¾	3	
3	8¼	1⅞	6⅝	8	¾	3¼	
3½	9	1⅜	7¼	8	¾	3¼	
4	10	1¼	7⅞	8	¾	3½	
4½	10½	1⅝	8½	8	¾	3½	
5	11	1⅜	9¼	8	¾	3¾	
6	12½	1⅞	10⅝	12	¾	3¾	
7	14	1½	11⅞	12	⅞	4	
8	15	1⅝	13	12	⅞	4¼	
9	16¼	1¾	14	12	1	4¾	
10	17½	1⅞	15¼	16	1	5	
12	20½	2	17¾	16	1⅞	5¼	
14	23	2⅞	20¼	20	1⅞	5½	
15	24½	2⅜	21½	20	1¼	5¾	
16	25½	2¼	22½	20	1¼	6	
18	28	2⅝	24¾	24	1¼	6¼	
20	30½	2½	27	24	1⅝	6½	
22	33	2⅝	29¼	24	1½	7	
24	36	2¾	32	24	1⅝	7½	9½
26	38¼	2⅜	34½	28	1⅝	7¾	10
28	40¾	2⅝	37	28	1⅝	8	10
30	43	3	39¼	28	1¾	8¼	10½
32	45¼	3⅞	41½	28	1⅞	8½	11
34	47½	3¼	43½	28	1⅞	9	11½
36	50	3⅝	46	32	1⅞	9¼	11½
38	52¼	3⅞	48	32	1⅞	9¼	11½
40	54½	3⅞	50¼	36	1⅞	9½	12
42	57	3⅜	52¾	36	1⅞	9¾	12
44	59¼	3¾	55	36	2	10	12½
46	61½	3⅞	57¼	40	2	10¼	13
48	65	4	60¾	40	2	10½	13

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter, and bolt holes straddle the center line.

Bolt holes are drilled ⅛ inch larger than nominal diameter of bolts. For Flanges with Male, Female Tongue or Groove Faces add ¼ inch to the bolt length given in table above.

For Cranelap Joints for each flange add the thickness of the pipe to the bolt length given in table above.



# **TEMPLATES FOR DRILLING** **EXTRA HEAVY HYDRAULIC FERROSTEEL** **FLANGED VALVES AND FITTINGS**

**FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:**

**1½ INCH TO 2½ INCH, 1200 POUNDS HYDROSTATIC**

**3 INCH TO 4 INCH, 1000 POUNDS HYDROSTATIC**

**4½ INCH TO 12 INCH, 800 POUNDS HYDROSTATIC**

Size	Diam- eter of Flanges	Thick- ness of Flanges	Diam- eter of Bolt Circle	Num- ber of Bolts	Size of Bolts	Length of Bolts	Diam- eter of Male	Height of Male	Diam- eter of Fe- male	Depth of Fe- male
Inches	Inches	Inches	Inches		Inches	Inches	Inches	Inches	Inches	Inches
1½	6½	1⅛	5	4	⅝	3¼	3⅛	⅜	3⅜	⅛
2	7½	1¼	5¾	4	¾	3¾	3⅝	⅜	3⅞	⅛
2½	8¾	1⅜	6½	8	¾	4	4⅛	⅜	4⅜	⅛
3	10	1⅞	8	8	¾	4¼	5	⅜	5⅛	⅛
3½	10¾	1⅝	8½	8	⅞	4½	5½	⅜	5⅞	⅛
4	11½	1⅞	9⅜	8	1	4¾	6	⅜	6⅛	⅛
4½	12½	1⅞	10	12	1	5	6½	⅜	6⅞	⅛
5	13½	1⅞	11	12	1	5¼	7¼	⅜	7⅝	⅛
6	15	2⅛	12½	12	1⅛	5¾	8⅜	⅜	8⅞	⅛
7	16	2¼	13⅜	16	1⅛	6	9⅜	¼	9⅞	⅜
8	17	2⅜	14⅜	16	1¼	6½	10⅝	¼	10⅞	⅜
9	18½	2⅞	15½	16	1¼	6¾	11⅝	¼	11⅞	⅜
10	21	2¾	17¾	20	1¼	7¼	12¾	¼	12⅞	⅜
12	23½	3⅛	20⅜	20	1⅜	8	15¼	¼	15⅝	⅜

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line.

Bolt holes are drilled ⅛ inch larger than nominal diameter of bolts.



## TEMPLATES FOR DRILLING

### EXTRA HEAVY HYDRAULIC CAST STEEL FLANGED VALVES AND FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

Size	Diam- eter of Flanges	Thick- ness of Flanges	Diam- eter of Bolt Circle	Num- ber of Bolts	Size of Bolts	Length of Bolts	Diam- eter of Male	Height of Male	Diam- eter of Fe- male	Depth of Fe- male
Inches	Inches	Inches	Inches		Inches	Inches	Inches	Inches	Inches	Inches
1½	6½	⅞	5	4	¾	2¾	2¼	⅜	2⅝	⅛
2	7½	1	5¾	4	⅞	3¼	2¾	⅜	2⅝	⅛
2½	8¾	1⅛	6½	8	⅞	3½	3⅝	⅜	3⅜	⅛
3	10	1¼	8	8	⅞	3¾	3⅝	⅜	4	⅛
4	11½	1⅜	9⅜	8	1⅛	4¼	5	⅜	5⅛	⅛
5	13½	1⅝	11	12	1⅛	4½	6⅝	⅜	6¼	⅛
6	15	1⅞	12½	12	1¼	4¾	7¼	⅜	7⅝	⅛

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter, and bolt holes straddle the center line.

Bolt holes are drilled ⅛ inch larger than nominal diameter of bolts and are regularly furnished spot faced.



CRANE PIPE BENDS IN STEAM LINE OF GULF STATES STEEL CO.

SEE PAGES 632 TO 635

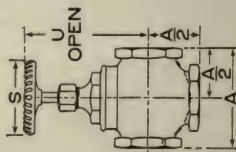
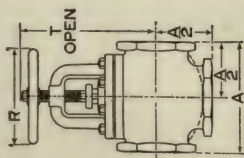
# STANDARD GLOBE, ANGLE AND CROSS VALVES

656

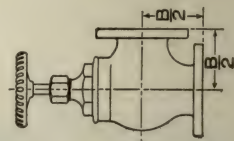
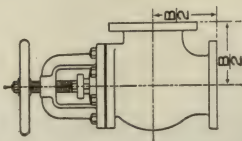
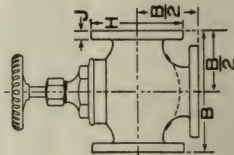
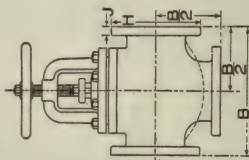
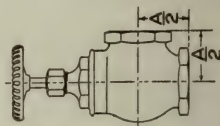
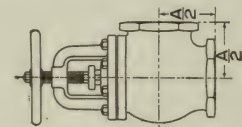
CRANE CO.

## GENERAL DIMENSIONS

IRON BODY



BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE OPPOSITE PAGE

# STANDARD GLOBE, ANGLE AND CROSS VALVES

## GENERAL DIMENSIONS

IRON BODY

BRASS TRIMMINGS

CATALOGUE Nos. 350, 351, 352, 353, 354, 355, 356, 357, 362, 363, 364, 365

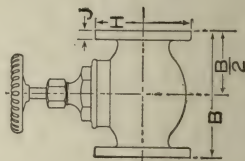
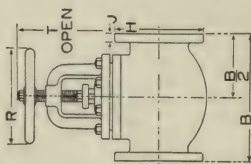
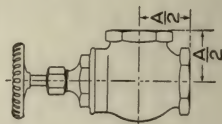
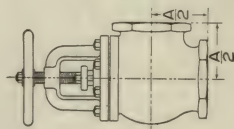
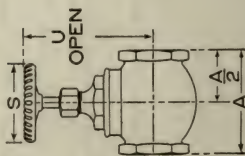
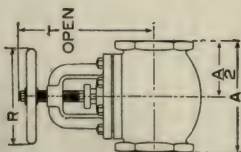
Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15	16
A—End to End, Screwed.....Inches	6½	7	8	9	10	10½	11¼	13	14½	16	18¾	21¼			
A—Center to End, Screwed.....Inches	3¼	3½	4	4½	5	5¼	5½	6½	7¼	8	9¾	10⅝			
B—Face to Face, Flanged.....Inches	8	8½	9½	10½	11½	12	13	14	16	17	20	24	28	30	32
B—Center to Face, Flanged.....Inches	4	4¼	4¾	5¼	5¾	6	6½	7	8	8½	10	12	14	15	16
H—Diameter of Flanges.....Inches	6	7	7½	8½	9	9¼	10	11	12½	13½	16	19	21	22¼	23½
J—Thickness of Flanges.....Inches	⅝	1½	¾	1⅜	1⅝	1⅞	1⅞	1	1½	1⅞	1¾	1¼	1⅜	1⅜	1⅞
R—Diameter of Wheel, Yoke Valve.....Inches	6½	6½	7½	7½	9	9	10	12	14	16	18	20	24	24	27
S—Diameter of Wheel, Brass Mounted Valve..Inches	4½	5¾	6												
T—Center to Top of Stem, Open, Yoke Valve.....Inches	10¾	11½	13	13¾	15¼	15½	17¼	19	21¼	23¾	27¾	31½	35½	39	39
U—Center to Top of Stem, Open, Brass Mounted Valve.....Inches	7½	8¾	9¾												

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

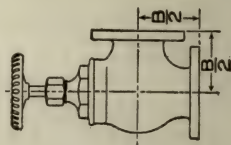
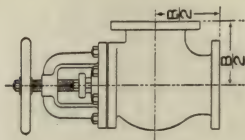
## JENKINS DISC GLOBE AND ANGLE VALVES

## GENERAL DIMENSIONS

## IRON BODY



## BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE



# JENKINS DISC GLOBE AND ANGLE VALVES

IRON BODY

GENERAL DIMENSIONS

BRASS TRIMMINGS

CATALOGUE Nos. 354, 355, 356, 357, 358, 359, 364, 365

Size	2	2½	3	3½	4	4½	5	6	7	8	10	12
A—End to End, Screwed.....Inches	6½	8	8¼	9½	10½	11¼	12¼	14	17	18½	22½	25½
A—Center to End, Screwed.....Inches	3¼	4	4½	4¾	5¼	5½	6½	7	8½	9¼	11¼	12¾
B—Face to Face, Flanged.....Inches		9½	10	11	12	13	13¾	16	17	18½	22½	25½
B—Center to Face, Flanged.....Inches		4¾	5	5½	6	6½	6¾	8	8½	9¼	11¼	12¾
H—Diameter of Flanges.....Inches		7	7½	8½	9	9¼	10	11	12½	13½	16	19
J—Thickness of Flanges.....Inches		1½	¾	1½	1½	1½	1½	1	1½	1½	1¾	1¼
R—Diameter of Wheel, Yoke Valve...Inches		6½	7½	7½	9	9	10	12	14	16	18	20
S—Diameter of Wheel, Brass Mounted Valve.....Inches	4¾	5¾	6									
T—Center to Top of Stem, Open, Yoke Valve.....Inches		11	12¾	13¾	15¾	16	17½	19½	22	24½	28½	33
U—Center to Top of Stem, Open, Brass Mounted Valve.....Inches	9	10	11½									

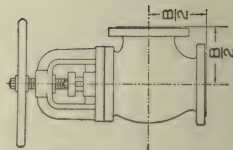
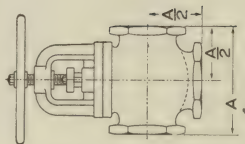
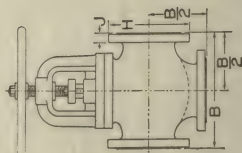
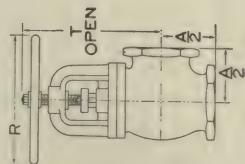
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

FOR DRILLING TEMPLATES, SEE PAGE 650

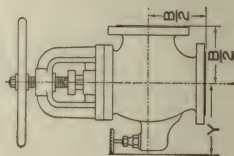
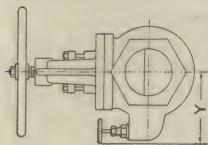
# MEDIUM GLOBE, ANGLE AND CROSS VALVES

## GENERAL DIMENSIONS

### FERROSTEEL BODY



### BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

## MEDIUM GLOBE, ANGLE AND CROSS VALVES

## GENERAL DIMENSIONS

CATALOGUE NOS. 340, 341, 341 BP, 342, 343, 343 BP, 344, 345, 345 BP

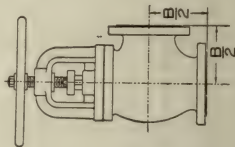
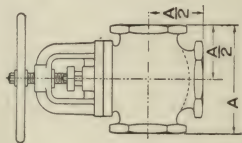
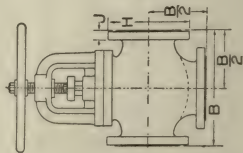
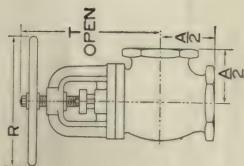
Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12
A—End to End, Screwed.....Inches	7¾	8	8¼	9½	10½	11¼	12¼	14	17	18½	22½	25½
A—Center to End, Screwed, Angle and Cross.....Inches	3⅞	4	4⅛	4¾	5¼	5⅝	6⅛	7	8½	9¼	11¼	12¾
B—Face to Face, Flanged.....Inches	9	10	11	12	13	13½	14½	16	17½	20	22½	25½
B—Center to Face, Flanged, Angle and Cross.....Inches	4½	5	5½	6	6½	6¾	7¼	8	8¾	10	11¼	12¾
H—Diameter of Flanges.....Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½
J—Thickness of Flanges.....Inches	⅞	1	1⅛	1⅜	1¼	1⅝	1⅝	1⅞	1½	1⅝	1⅞	2
R—Diameter of Wheel.....Inches	6½	7½	9	10	10	12	12	14	14	16	20	20
T—Center to Top of Stem, Open.....Inches	11¾	12⅝	14¼	15⅜	16⅜	17⅞	18¼	20¼	21¼	24⅛	28½	31
Y—Center to Outside of By-Pass.....Inches								9¼	10	12	13¾	15¾
Size of By-Pass.....Inches								1¼	1¼	1½	1½	2

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

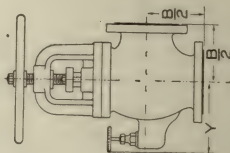
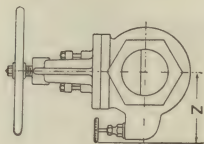
# EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

## GENERAL DIMENSIONS

### FERROSTEEL BODY



### BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

## EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

## GENERAL DIMENSIONS

CATALOGUE Nos. 20 E, 21 E, 22 E, 23 E, 24 E, 25 E, 27 E, 29 E, 31 E

Size.....	Inches	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15
A—End to End, Screwed.....	Inches	9½	10¾	11¾	12¼	13	14	15	16½	18¼	20	23¼			
A 2—Center to End, Screwed.....	Inches	4¾	5¾	5¾	6¾	6½	7	7½	8¾	9¾	10	11½			
B—Face to Face, Flanged.....	Inches	10½	11½	12½	13¼	14	15	15¾	17½	19¼	21	24½	28	33	33
B 2—Center to Face, Flanged.....	Inches	5¼	5¾	6¼	6¾	7	7½	7¾	8¾	9¾	10½	12¼	14	16½	16½
H—Diameter of Flanges.....	Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½	23	24½
J—Thickness of Flanges.....	Inches	¾	1	1⅛	1¾	1¼	1⅝	1¾	1¾	1½	1⅝	1¾	2	2⅛	2⅛
R—Diameter of Wheel.....	Inches	7½	9	10	10	14	14	16	18	20	24	27	30	36	36
T—Center to Top of Stem, Open.....	Inches	13¾	14½	17½	17½	19½	19½	21½	25	26¼	29½	33½	39	42	42
Y—Center to Outside of By-Pass, Angle and Cross.....	Inches								11¾	11¾	13¾	14¾	17¼	19¾	19¾
Z—Center to Outside of By-Pass, Globe.....	Inches								11¾	11¾	13¾	14¾	17¼	18¾	18¾
Size of By-Pass.....	Inches								1¼	1¼	1½	1½	2	2	2

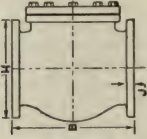
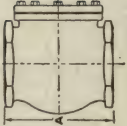
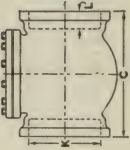
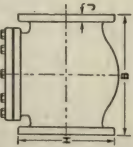
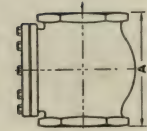
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.



STANDARD CHECK VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 366, 367, 368, 369, 372, 373, 374



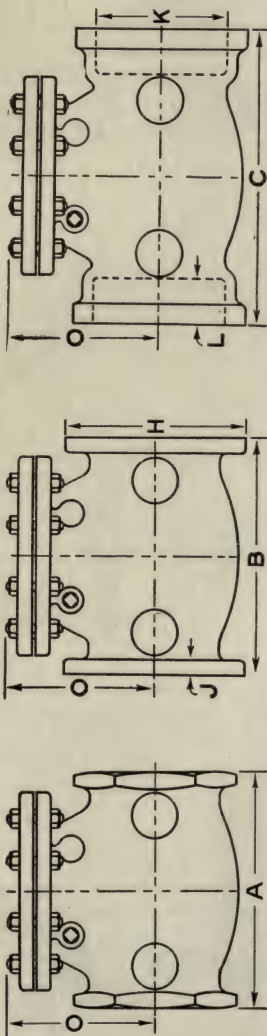
Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15	16	18	20	24	30
A—End to End, Screwed, Nos. 366 and 368.....	6½	7	8	9	10	10½	11¼	13	14½	16	18¾	21¼							
A—End to End, Screwed, No. 372.....	6½	6⅝	7½	8¼	9¾	10¼	11¼	12½	14	16	18¾	21¼							
B—Face to Face, Flanged.....	8	8½	9½	10½	*	12	13	14	16	17	20	24	28	30	32	36	40	48	60
C—End to End, Hub.....			10½		12		13	14		18	19	25	28½		30	32	35	40	50
H—Diameter of Flanges.....	6	7	7½	8½	9	9¼	10	11	12½	13½	16	19	21	22¼	23½	25	27½	32	38¾
J—Thickness of Flanges.....	⅝	¾	¾	1⅛	1⅛	1⅛	1⅝	1	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	2⅞
K—Inside Diameter of Hub.....			4¾		5⅝		6¾	7⅞		10	12¼	14⅜	16½		18¾	20⅞	23	27¾	34
L—Depth of Hub.....			2¾		3		3	3		3½	3½	3½	3½		4	4	4	4	4½

\* { 4 inch No. 373 Swing Check, face to face, flanged, is 11 inches.  
4 inch Nos. 367 and 369 Horizontal and Vertical Checks, face to face, flanged, is 11½ inches.

# STANDARD CLEARWAY SWING CHECK VALVES

## GENERAL DIMENSIONS

CATALOGUE Nos. 374½, 375, 375½



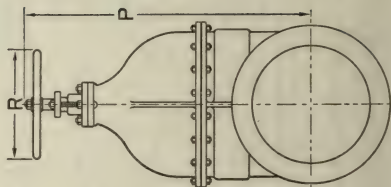
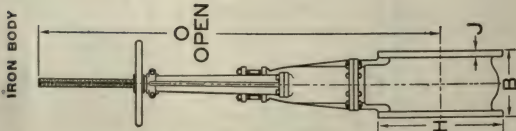
Size.....	2½	3	4	5	6	8	10	12
A—End to End, Screwed.....	10	11	13	15	16	18	22	26
B—Face to Face, Flanged.....	10	11	13	15	16	18	22	26
C—End to End, Hub End.....		14½	18½	18½	20	22¼	26	29½
H—Diameter Flanges.....	7	7½	9	10	11	13½	16	19
J—Thickness Flanges.....	1½	¾	1½	1½	1	1½	1¾	1¼
K—Inside Diameter Hub.....		4¾	5½	6¾	7¾	10	12¼	14¾
L—Depth of Hub.....		2¾	3	3	3	3½	3½	3½
O—Center to Cap Over All.....	6¼	6½	7¾	8¾	9¾	11¼	13½	15¼

These dimensions are subject to a slight variation and change without notice.

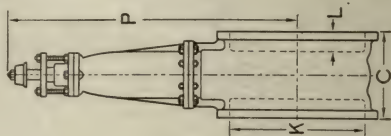
TEMPLATES FOR DRILLING, PAGE 650

# LOW PRESSURE GATE VALVES

## GENERAL DIMENSIONS



## BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

# LOW PRESSURE GATE VALVES

## GENERAL DIMENSIONS

CATALOGUE Nos. 491, 493, 498

Size.....Inches	4	6	8	10	12	14	15	16	18	20	22	24	26	28	30	32	34	36	40	42	48
B—Face to Face, Flanged...Inches					11	13 $\frac{1}{2}$	13 $\frac{1}{2}$	14	14 $\frac{1}{2}$	15 $\frac{1}{2}$	16 $\frac{1}{2}$	17	18 $\frac{1}{2}$	20	21	22	23	24	26	27	30
C—End to End, Hub End...Inches	8 $\frac{7}{8}$	9 $\frac{3}{8}$	11	11 $\frac{7}{8}$	12 $\frac{1}{2}$	13 $\frac{1}{4}$		14 $\frac{3}{4}$	16	16 $\frac{3}{4}$		17 $\frac{1}{2}$			21 $\frac{1}{4}$			24		30	33
H—Diameter of Flanges.....Inches					19	21	22 $\frac{1}{4}$	23 $\frac{1}{2}$	25	27 $\frac{1}{2}$	29 $\frac{1}{2}$	32	34 $\frac{1}{4}$	36 $\frac{1}{2}$	38 $\frac{3}{4}$	41 $\frac{3}{4}$	43 $\frac{3}{4}$	46	50 $\frac{3}{4}$	53	59 $\frac{1}{2}$
J—Thickness of Flanges.....Inches					1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{7}{16}$	1 $\frac{8}{16}$	1 $\frac{11}{16}$	1 $\frac{13}{16}$	1 $\frac{7}{8}$	2	2 $\frac{1}{16}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{5}{16}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{4}$
K—Inside Diameter of Hub..Inches	5 $\frac{5}{8}$	7 $\frac{7}{8}$	10	12 $\frac{1}{4}$	14 $\frac{3}{8}$	16 $\frac{1}{2}$		18 $\frac{3}{4}$	20 $\frac{7}{8}$	23		27 $\frac{1}{4}$			34			40 $\frac{1}{2}$	46 $\frac{3}{4}$	53	
L—Depth of Hub.....Inches	3	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$		4	4	4		4			4 $\frac{1}{2}$			4 $\frac{1}{2}$		5	5
O—Center to Top of Rising Stem, Open..Inches					58	64 $\frac{1}{2}$	68	71 $\frac{1}{2}$	79	87 $\frac{1}{2}$	94 $\frac{1}{2}$	105 $\frac{1}{2}$	111 $\frac{1}{2}$	120	126 $\frac{1}{2}$	134 $\frac{1}{2}$	144	150	171 $\frac{3}{4}$		
P—Center to Top of Non-Rising Stem..Inches	14 $\frac{3}{4}$	18 $\frac{1}{2}$	23 $\frac{1}{8}$	27 $\frac{1}{8}$	33	36 $\frac{1}{2}$	38	40 $\frac{1}{2}$	44	48 $\frac{1}{2}$	51 $\frac{1}{2}$	58	61	65	67 $\frac{1}{2}$	71	76	80	93	102	114
R—Diameter of Wheel.....Inches					16	16	16	16	18	18	20	20	22	24	24	24	20	30	36		
Number of Turns to Open.....	13	13	17	21	25	29	31	33	37	41 $\frac{1}{2}$	45 $\frac{1}{2}$	49 $\frac{1}{2}$	53 $\frac{1}{2}$	57 $\frac{1}{2}$	62	66	70	74			

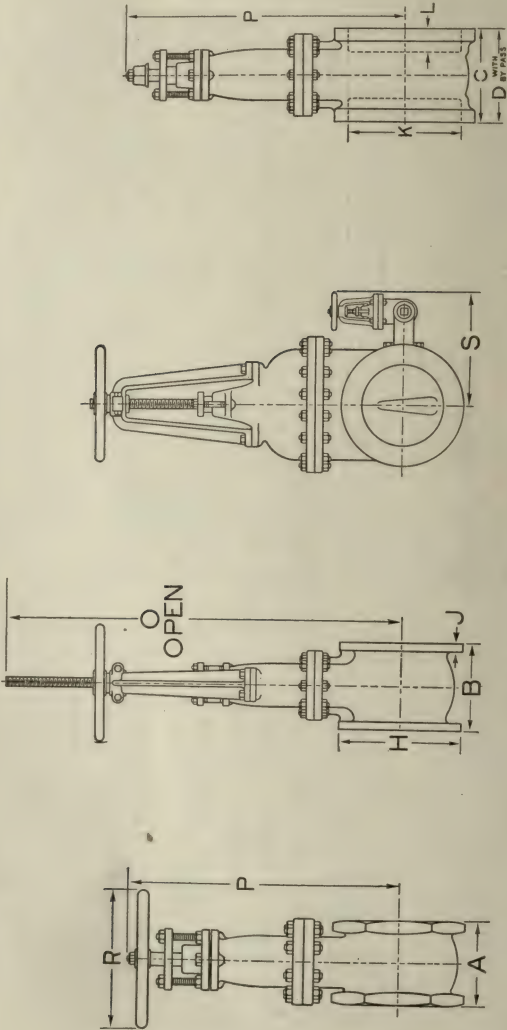
The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

STANDARD GATE VALVES

GENERAL DIMENSIONS

IRON BODY

BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE



## STANDARD GATE VALVES

## GENERAL DIMENSIONS

CATALOGUE NOS. 460, 461, 462, 464, 464½, 465, 465½

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	36
A—E. to E., Screwed.....Ins.	5½	5¾	6¼	6½	6¾	7¼	7¾	8¼	8¾	9¼	9¾	10¾	11½											
B—F. to F., Flanged.....Ins.	7	7½	8	8½	9	9½	10	10½	11	11½	12	13	14	15	15	16	17	18	19	20	23	26	30	36
C—E. to E. Hub End.....Ins.	8½		9		10¼	10¾	10¾	10¾	12			12¾	13½	13¾		16	17	17		18	22	26	30	32
D—E. to E. Hub End with By-Pass Ins.														16		19	20	21		22	22	26	30	32
H—Diameter Flanges.....Ins.	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32	34½	36½	38¾	46
J—Thickness of Flanges.....Ins.	5/8	1½	¾	1¾	1¾	1¾	1¾	1	1½	1½	1½	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	2	2¼	2½	2¾
K—Inside Diameter of Hub....Ins.	3¼		4¾		5½	6¾	7¾	9	10			12¼	14¾	16½		18¾	20¾	23		27¼	29¾	31½	34	40½
L—Depth of Hub.....Ins.	2¾		2¾		3	3	3	3	3½			3½	3½	3½		4	4	4		4	4	4½	4½	4½
O—C. to Top of Rising Stem, Open Ins.	14½	16	19	21¼	24	25½	28½	31¾	37¼	41	44¾	50	57¼	60¾	69¾	75¼	86	91	100	109	117½	125	133	158½
P—C. to Top of Non-Rising Stem. Ins.	11¾	12¾	14¼	15¼	16¼	17½	19	20¾	23	26	28	30¼	35¼	39¼	41¾	44¼	48¾	52½	55½	62	65¾	70	75½	83
R—Diameter of Wheel.....Ins.	6½	6½	7½	7½	9	9	10	12	12	14	14	16	18	20	20	22	24	24	27	30	30	36	36	
S—Center to Outside of By-Pass. Ins.														19½	21	23¾	24¾	27¾	29	30½	32	33	34	39
Size of By-Pass.....Ins.														2	2	3	3	4	4	4	4	4	4	6
Number of Turns to Open.....	7	8¼	9½	11¼	8¾	9¾	10¾	13¼	15	17	19¼	21½	25½	30	31½	33¼	35½	42¼	46	50	65	80	92½	108

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

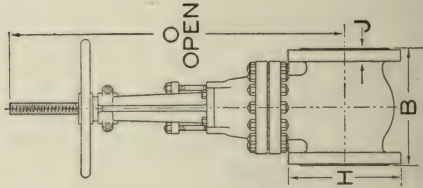
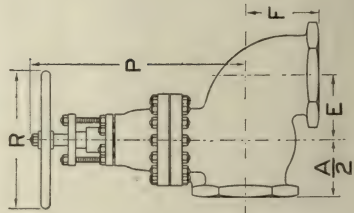
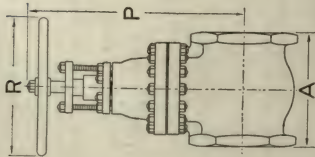
General dimensions of Valves larger than 36 inch, will be furnished on application.

FOR DRILLING TEMPLATES, SEE PAGE 650

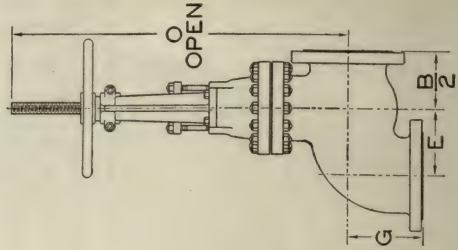
# MEDIUM GATE VALVES

## GENERAL DIMENSIONS

FERROSTEEL BODY



BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

## MEDIUM GATE VALVES

## GENERAL DIMENSIONS

CATALOGUE Nos. 500, 501, 503, 504, 505, 507, 511, 513

Size.....	Inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	24
A—End to End, Screwed.....	Inches	5½	6	7¼	7½	7¾	8¾	8½	8¾	9¼	10	10¾	11½	12½						
A—Center to End, Screwed.....	Inches	2¾	3	3½	3¾	3⅞	4⅞	4¾	4¾	4¾	5	5¾	5¾	6¼						
B—Face to Face, Flanged.....	Inches	7½	8	9½	10	10½	11	11½	12	12½	13½	14	15	16	18	18¾	19½	21	22½	25½
B—Center to Face, Flanged.....	Inches	3¾	4	4¾	5	5¼	5½	5¾	6	6¼	6¾	7	7½	8						
E—Center to Center, Angle.....	Inches	3½	3¾	4⅞	5¼	5¾	6¼	6½	7½	8½	9	9½	10¼	13						
F—Center to End, Screwed, Angle. Ins.	Ins.	2¾	3¾	4	4½	5	5½	6	6½	7	7½	8	9	10						
G—Center to Face, Flanged, Angle. Ins.	Ins.	3½	4¼	4¾	5½	6	6¾	7½	8¼	8½	9	10½	11½	13						
H—Diameter of Flanges.....	Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	36
J—Thickness of Flanges.....	Inches	7½	1	1⅞	1¾	1¼	1⅝	1⅞	1⅞	1½	1⅝	1¾	1⅞	2	2½	2⅜	2¼	2⅜	2½	2¾
O—Center to Top of Rising Stem.....	Inches	14	15½	18¾	20½	23¾	25	28½	31½	35¾	40¾	44¼	49¾	56⅞	64½	68¾	74½	82¼	92	108
P—Center to Top of Non-Rising Stem.....	Inches	11¼	12¼	14	14¾	16¼	17	19	21	22½	25½	27½	30½	33¾	38½	41	44¾	47½	52	61¾
R—Diameter of Wheel.....	Inches	6½	6½	7½	7½	9	9	10	12	12	14	14	16	18	20	20	22	24	24	30
S—Center to Outside of By-Pass. Inches	Inches								14½	15½	15½	16½	17½	18½	19¾	20½	22¾	24¼	28	30
Size of By-Pass.....									1¼	1¼	1½	1½	1½	2	2	2	3	3	4	4
Number of Turns to Open.....	Inches	6¾	7¾	9¾	11¼	9	10	11	25	30	34	38	42	50	59	64	67	76	84	101

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head loss. They should not, however, be used for figuring extended stems.

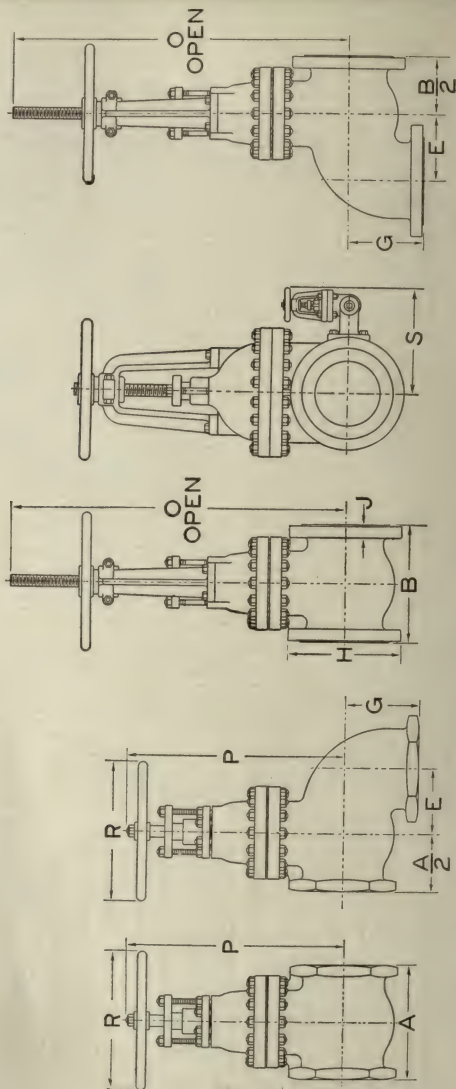
FOR DRILLING TEMPLATES, SEE PAGE 652

## EXTRA HEAVY GATE VALVES

## GENERAL DIMENSIONS

FERROSTEEL BODY

BRASS TRIMMINGS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

# EXTRA HEAVY GATE VALVES

## GENERAL DIMENSIONS

CATALOGUE NOS. 2 E, 3 E, 5 E, 6 E, 7 E, 9 E, 11 E, 12 E

Size.....Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—End to End, Screwed...Ins.	5 1/2	6 1/4	7	8	9	10	11	12 1/4	13 1/2	15 7/8	16 1/4	16 1/2	17	18								
A $\frac{A}{2}$ —Center to End, Screwed.....Ins.	2 3/4	3 1/8	3 1/2	4	4 1/2	5	5 1/2	6 1/8	6 3/4	7 1/8	8 1/8	8 1/4	8 1/2	9								
B—Face to Face, Flanged...Ins.	6 1/2	7 1/2	8 1/2	9 1/2	11 1/8	11 7/8	12	13 1/4	15	15 7/8	16 1/4	16 1/2	17	18	19 3/4	22 1/2	22 1/2	24	26	28	29 1/2	31
B $\frac{B}{2}$ —Center to Face, Flanged.....Ins.	3 1/4	3 3/4	4 1/4	4 3/4	5 1/8	5 1/2	6	6 5/8	7 1/2	7 1/8	8 1/8	8 1/4	8 1/2	9	9 7/8							
E—Center to Center, Angle.....Ins.	2	2 1/4	3 1/8	3 3/4	4 7/8	5 1/4	5 3/4	6 1/4	6 5/8	7 1/2	8 1/2	9	9 1/2	10 1/4	11 3/4							
G—Center to Face, Angle...Ins.	2 7/8	3 1/4	3 1/2	4 1/4	4 7/8	5 1/2	6	6 3/4	7 5/8	8 1/4	8 3/4	9 5/8	10 1/2	11 1/2	13							
H—Diameter of Flanges...Ins.	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2	25 1/2	28	30 1/2	33	36
J—Thickness of Flanges...Ins.	3/4	1 1/8	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4	2 3/4
O—O. to Top of Rising Stem, Open...Ins.	10 5/8	12 1/4	13 3/4	16	19 1/2	22	24 1/2	27	29 3/4	34 1/8	38	42 3/4	47	52 3/4	60	67 3/4	67 3/4	75 1/4	82 1/4	91 1/2	101	113
P—Center to Top of Non-Rising Stem...Ins.	8 3/4	9 5/8	10 1/2	12 7/8	14 5/8	15 1/2	17 3/4	18 3/4	20 1/4	23	24 3/4	28 3/4	30 1/2	33 3/4	37 1/4	42 3/4	42 3/4					
R—Diameter of Wheel...Ins.	5	5 1/2	6 1/2	7 1/2	9	10	12	12	14	16	18	20	20	22	24	24	24	27	30	30	36	36
S—Center to Outside of By-Pass...Ins.										12 1/4	13	14 1/8	15 7/8	16 3/8	19 7/8	20 5/8	20 5/8	25 1/4	26 1/2	30 1/2	32 1/4	33
Size of By-Pass.....Ins.										1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2	2	2	3	3	4	4	4
Number of Turns to Open...Ins.	12	11	14	15	14	16	18	21	23	28	30	34	40	39	46	52	52	60	67	74	82	88

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

FOR DRILLING TEMPLATES, SEE PAGE 652



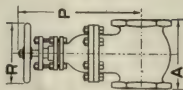
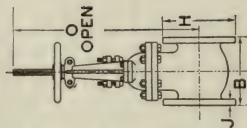
## STANDARD DOUBLE DISC GATE VALVES

## GENERAL DIMENSIONS

IRON BODY

BRASS TRIMMINGS

CATALOGUE Nos. 480, 481, 482, 483



Size.....	Inches																				
A—End to End, Screwed...	5½	6¼	7	7½	7¾	9½	11	11¼	12	12½	12¾	13½	13½	14	15	16	18	20	22	24	
B—Face to Face, Flanged..	5½	6¼	6¾	7½	8¼	9½	10¾	11½	11¼	13¼	13½	13¾	14½	15¾	15¾	17	18½	20	22	24	
H—Diameter of Flanges...	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32	
J—Thickness of Flanges....	5/8	¾	¾	¾	¾	¾	¾	1	1	1	1	1	1	1	1	1	1	1	1	1	
O—Center to Top of Rising Stem, Open.	14¼	15½	18½	21	23	25	28¼	32¼	35	40½	47	49½	57	63	68	75¾	83½	93	103½	115	
P—Center to Top of Non-Rising Stem...	11½	12¼	14	15¼	16½	17½	19	20¼	23	25¾	28	30	33½	39	42	46	47¾	51½	54½	61	
R—Diameter of Wheel.....	6½	6½	7½	7½	9	9	10	12	12	14	14	16	18	20	20	22	24	24	27	30	
Number of Turns to Open .....	7½	9	10½	12	9	10½	11	13	16	18		22	26	31		35	40	43	47	52	

The heights from center of Valve to top of Stem, in the above table, are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

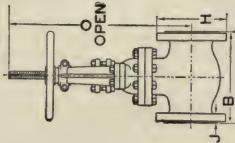
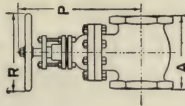
EXTRA HEAVY DOUBLE DISC GATE VALVES

GENERAL DIMENSIONS

IRON BODY

CATALOGUE Nos. 54 E, 55 E, 57 E, 58 E

BRASS TRIMMINGS



Size.....	Inches.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
A—End to End, Screwed.....	Inches.....	8	8⅞	9⅝	10	10½	11¼	12¼	13¼	14¼	15¼	16½	17¾	19
B—Face to Face, Flanged.....	Inches.....	7¼	8	9¼	9½	10¾	10¾	11	12½	13¾	14¼	16¾	16¾	17½
H—Diameter of Flanges.....	Inches.....	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½
J—Thickness of Flanges.....	Inches.....	⅞	1	1⅛	1⅜	1¼	1⅝	1⅞	1⅞	1½	1⅝	1¾	1⅞	2
O—Center to Top of Rising Stem, Open.....	Inches.....	15½	18	19⅝	21½	24¼	27	30¾	33¼	37¼	43	47¼	53½	60½
P—Center to Top of Non-Rising Stem.....	Inches.....	12⅜	13⅞	15¼	16¼	17½	18½	19¾	22¼	26½	27⅞	31	35	39¼
R—Diameter of Wheel.....	Inches.....	7½	7½	9	10	12	12	14	16	18	20	20	22	24
Number of Turns to Open.....	.....	15	18	15	17	19	21	24	28	31	36		46	56

The heights from center of Valve to top of Stem, in the above table, are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

FOR DRILLING TEMPLATES, SEE PAGE 652

# EXTRA HEAVY HYDRAULIC GATE VALVES

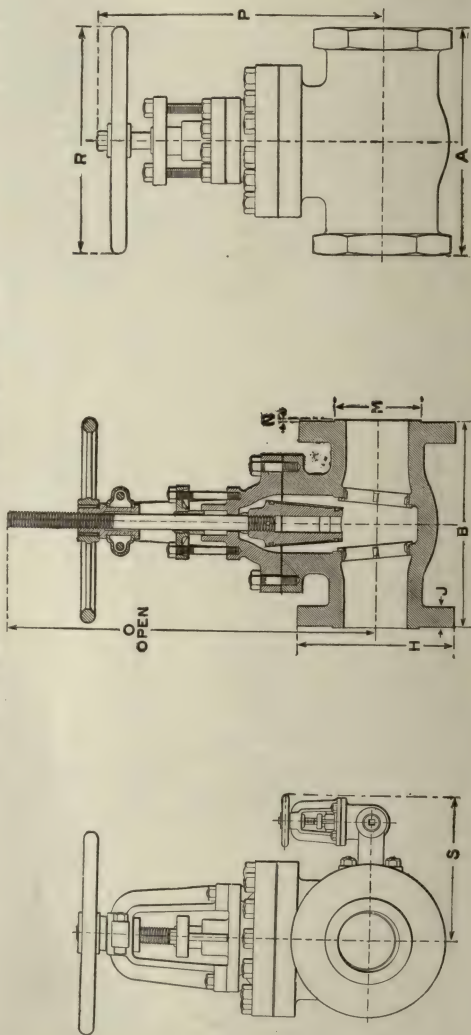
FERROSTEEL BODY

HARD METAL SEATS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 AND 4 INCH, 1000 LBS. HYDROSTATIC; 5 TO 12 INCH, 800 LBS. HYDROSTATIC

CAT. NOS. 200 H, 201 H, 203 H, 204 H, 205 H, 207 H



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

## EXTRA HEAVY HYDRAULIC GATE VALVES

## GENERAL DIMENSIONS

Size.....	Inches	1½	2	2½	3	4	5	6	7	8	10	12
A—End to End, Screwed....	Inches	10	11½	13½	14½	16½	18½	20	21½	23	26½	29½
B—Face to Face, Flanged..	Inches	10	11½	13½	14½	16½	18½	20	21½	23	26½	29½
H—Diameter of Flanges...	Inches	6½	7½	8¾	10	11½	13½	15	16	17	21	23½
J—Thickness of Flanges....	Inches	1½	1¼	1¾	1¾	1¾	1¾	2½	2¼	2½	2¾	3½
M—Diameter of Male.....	Inches	3½	3¾	4½	5	6	7¼	8¾	9¾	10¾	12¾	15¼
N—Height of Male.....	Inches	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Diameter of Female.....	Inches	3¾	3¾	4¾	5¾	6¾	7¾	8¾	9¾	10¾	12¾	15¾
Depth of Female.....	Inches	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
O—Center to Top of Rising Stem—Open.	Inches	15½	18	20½	22½	27¾	31¾	35¾	41¼	45¼	53½	62¼
P—Center to Top of Non-Rising Stem.	Inches	12¾	14¼	16	17¾	20½	23¼	24¾	28¼	29½	34¾	40¾
R—Diameter of Wheel.....	Inches	7½	10	12	14	16	18	20	22	24	27	30
S—Center to Outside of By-Pass.....	Inches							14¾	15	17¾	18¾	21½
Size of By-Pass.....	Inches							1¼	1¼	1½	1½	2
Number of Turns to Open.....		9¼	9¼	11½	14	18	22½	26½	27½	30¾	38	45

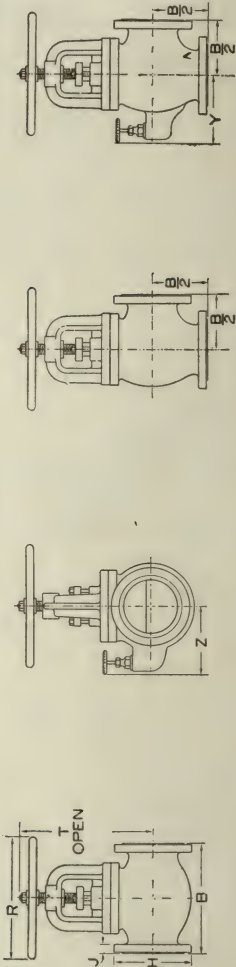
The heights from center of Valve to top of stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

The length, Face to Face, of Male or Female Flanged Valves is measured from the Face of the Flange and not from Tongue or Recess.

For drilling templates, see page 653.

EXTRA HEAVY CAST STEEL GLOBE AND ANGLE VALVES

GENERAL DIMENSIONS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE



# EXTRA HEAVY CAST STEEL GLOBE AND ANGLE VALVES

## GENERAL DIMENSIONS

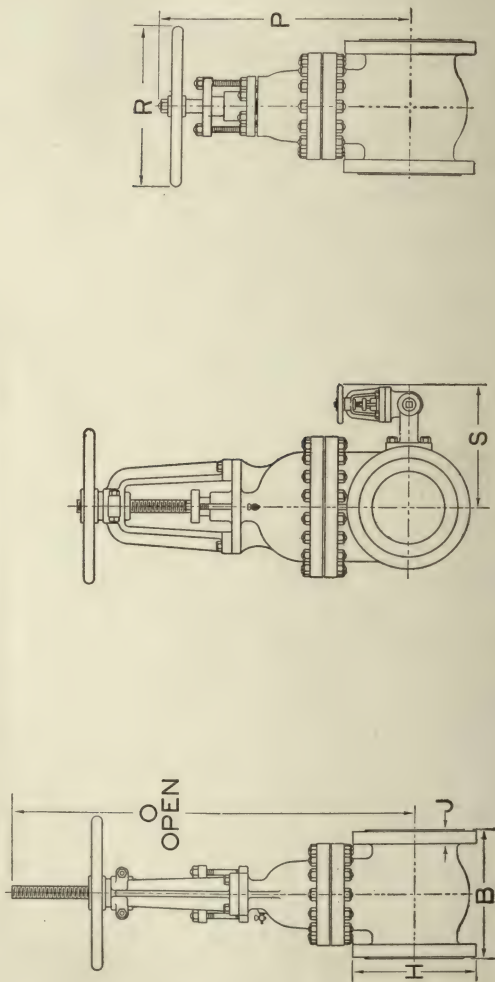
CATALOGUE NOS. 21 A, 21 B, 21 C, 21 D, 27 A, 27 B, 27 C, 23 A, 23 B, 23 C, 23 D, 29 A, 29 B, 29 C

Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15
B—Face to Face, Flanged.....Inches	10½	11½	12½	13¾	14	15	15¾	17½	19¼	21	24½	28	33	33
B—Center to Face, Flanged.....Inches	5¼	5¾	6¼	6½	7	7½	7¾	8¾	9½	10½	12¼	14	16½	16½
H—Diameter of Flanges.....Inches	6½	7½	8¼	9	10	10½	11	12½	14	15	17½	20½	23	24½
J—Thickness of Flanges.....Inches	7/8	1	1½	1¾	1¾	1¾	1¾	1¾	1½	1½	1¾	2	2½	2¾
R—Diameter of Wheel.....Inches	7½	9	10	10	14	14	16	18	20	24	27	30	36	36
T—Center to Top of Stem, Open.....Inches	13¾	14½	17½	17½	19½	19½	21½	25	26¼	29½	33½	39	42	42
Y—Center to Outside of By-Pass, Angle and Cross.....Inches								11¾	11¾	13¾	14¾	17¼	19¾	19¾
Z—Center to Outside of By-Pass, Globe.....Inches								11¾	11¾	13¾	14¾	17¼	18¾	18¾
Size of By-Pass.....Inches								1¼	1¼	1½	1½	2	2	2

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

## EXTRA HEAVY CAST STEEL GATE VALVES

## GENERAL DIMENSIONS



FOR DIMENSION TABLE, SEE FOLLOWING PAGE

## EXTRA HEAVY CAST STEEL GATE VALVES

## GENERAL DIMENSIONS

CATALOGUE NOS. 3 D, 5 D, 7 A, 7 B, 7 C, 7 D, 9 A, 9 B, 9 C, 9 D

Size.....Ins.	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20	22	24
B—Face to Face, Flanged. Ins.	6 1/2	7 1/2	8 1/2	9 1/2	11 1/8	11 7/8	12	13 1/4	15	15 7/8	16 1/4	16 1/2	17	18	19 3/4	22 1/2	22 1/2	24	26	28	29 1/2	31
H—Diameter of Flanges..Ins.	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2	25 1/2	28	30 1/2	33	36
J—Thickness of Flanges..Ins.	3/4	1 1/8	7/8	1	1 1/8	1 3/8	1 1/4	1 5/8	1 3/4	1 7/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/8	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4
O—C. to Top of Rising Stem, Open...Ins.	12 1/2	13 7/8	15 3/8	17 7/8	21 3/8	24 1/2	27 1/8	29 1/2	32 1/2	37 1/4	41	46 1/8	51 1/2	57 1/2	64 3/4	71 3/4	80 1/8	87 3/8	96 3/8	109	120	
P—Center to Top of Non-Rising Stem. Ins.	8 3/4	9 5/8	10 1/2	12 7/8	14 5/8	15 1/2	17 3/4	18 3/4	20 3/4	23	24 3/4	28 3/4	30 1/2	33 3/4	37 1/4	42 3/4	42 3/4					
R—Diameter of Wheel....Ins.	5	5 1/2	6 1/2	7 1/2	9	10	12	12	14	16	18	20	20	22	24	24	24	27	30	30	36	36
S—Center to Outside of By-Pass...Ins.										13	14 1/8	15 7/8	16 3/8	16 7/8	19 7/8	20 5/8	20 5/8	25 1/4	26 1/2	30 1/2	32 1/4	33
Size of By-Pass.....Ins.										1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2	2	2	3	3	4	4	4
Number of Turns to Open.....	12	11	14	15	14	16	18	21	23	28	30	34	40	39	46	52	52	60	67	74	82	88

The heights from center of Valve to top of Stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used to figure extended stems.

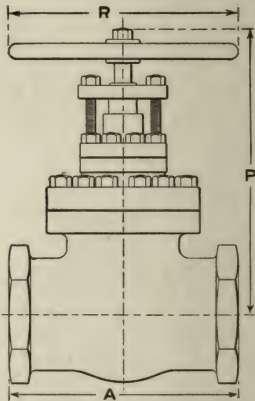
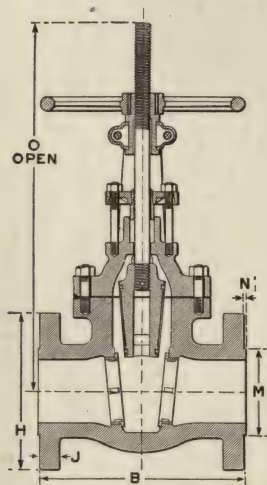
FOR DRILLING TEMPLATES, SEE PAGE 682

# EXTRA HEAVY HYDRAULIC CAST STEEL GATE VALVES

## GENERAL DIMENSIONS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

CAT. Nos. 200 D, 201 D, 204 D, 205 D



Size.....Inches	2	2½	3	4	5	6
Inside Diameter of Port....Inches	1½	2	2½	3	4	5
A—End to End, Screwed...Inches	11	13	14	16	18	21
B—Face to Face, Flanged...Inches	11½	13½	14½	16½	18½	21½
H—Diameter of Flanges...Inches	7½	8¾	10	11½	13½	15
J—Thickness of Flanges....Inches	1	1⅝	1¼	1⅝	1⅝	1⅝
M—Diameter of Male.....Inches	2¾	3⅝	3⅝	5	6⅝	7¼
N—Height of Male.....Inches	⅜	⅜	⅜	⅜	⅜	⅜
O—Center to Top of Rising Stem, Open. Inches	15½	18¼	20⅞	23¼	27⅞	32⅞
P—Center to Top of Non-Rising Stem...Inches	12½	14½	16¼	18¼	20¾	23½
R—Diameter of Wheel....Inches	7½	10	12	14	16	18
Diameter of Female.....Inches	2⅛	3⅜	4	5⅛	6¼	7⅝
Depth of Female.....Inches	⅛	⅛	⅛	⅛	⅛	⅛

The inside diameter of these Valves is approximately the same as that of Double Extra Strong Pipe.

The heights from center of Valve to top of stem in the above table are approximate only, but are accurate enough for figuring head room. They should not, however, be used for figuring extended stems.

The length, Face to Face, of Male or Female Flanged Valves is measured from the Face of the Flange and not from Tongue or Recess.

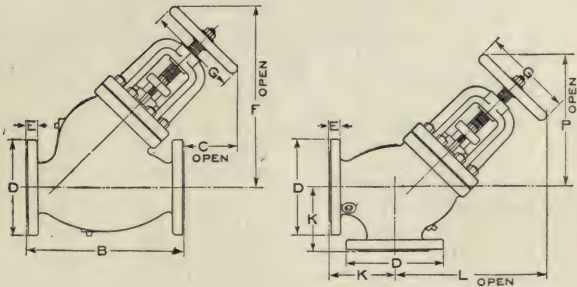
For drilling templates, see page 654.

## EXTRA HEAVY

# STOP CHECK VALVES

### GENERAL DIMENSIONS

CATALOGUE NOS, 28 E, 30 E, 28 A, 30 A



Size.....Inches	2½	3	4	5	6	7	8	10
B—Face to Face, Flanged, Straight...Inches	13	14¾	17	19	21½	23½	26	30
C—F. of Flange to Rim of Wheel, Open, Straight. In.	6	7	8	10¾	12	14½	16¼	20
D—Diameter of Flanges.....Inches	7½	8¼	10	11	12½	14	15	17½
E—Thickness of Flanges.....Inches	1	1⅛	1¼	1⅜	1⅞	1½	1⅝	1⅞
F—Center to Top of Wheel, Open, Straight. Inches	17	19	23	26¾	29¾	33¾	36¾	44¼
G—Diameter of Wheel.....Inches	7½	9	10	14	16	18	20	24
K—Center to Face, Angle...Inches	5¾	6¼	7	7⅞	8¾	9⅝	10½	12¾
L—Center to Rim of Wheel, Open, Angle. Inches	14	16½	18	22½	26	29	33	40
P—Center to Rim of Wheel, Open, Angle. Inches	12½	14½	16½	19½	23	26	28	35

The Flanges of these Valves are regularly furnished with a raised face ⅛ inch high inside the bolt holes.

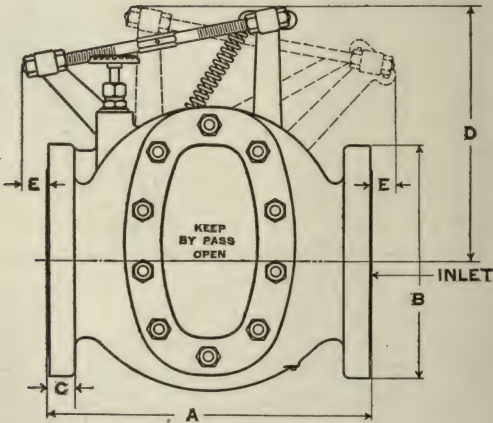
For drilling templates, see page 652.



CRANE-ERWOOD  
AUTOMATIC DOUBLE ACTING  
NON-RETURN AND EMERGENCY  
CUT-OUT VALVES

GENERAL DIMENSIONS

CATALOGUE Nos. 36 E, 37 E, 36 A, 37 A



Size.....Inches	4	5	6	7	8	10
A—Face to Face.....Inches	14	15¾	17½	19¼	21	24½
B—Diameter of Flanges...Inches	10	11	12½	14	15	17½
C—Thickness of Flanges...Inches	1¼	1⅜	1⅞	1½	1⅝	1⅞
D—Center to Top of Lever..Inches	11¾	12½	13¾	14¾	16¼	18¼
E—Overhang of Lever.....Inches	1½	1¾	1½	1¾	1¾	1½

## GENERAL DIMENSIONS

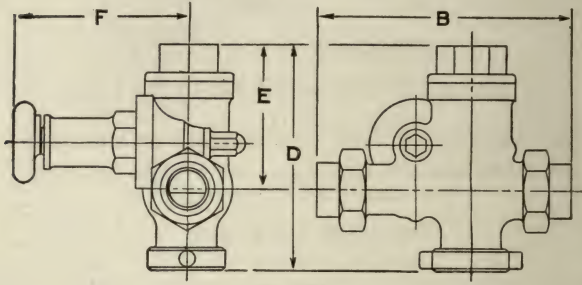
AUTOMATIC EXHAUST RELIEF AND COMBINATION  
BACK PRESSURE AND EXHAUST RELIEF VALVES

## FLANGED VALVES

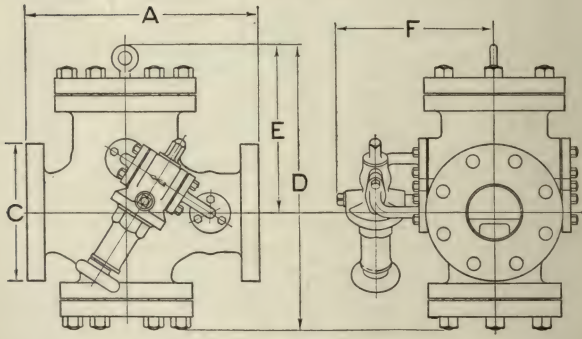
Size Inches	Face to Face Horizontal or Vertical Inches	Center to Face of Inlet or Outlet Angle or DD Inches	Diameter of Flanges Inches	Thickness of Flanges Inches
4	11½	5¾	9	1½
4½	12	6	9¼	1½
5	13	6½	10	1½
6	14	7	11	1
7	16	8	12½	1½
8	17	8½	13½	1½
9	18	9¼	15	1½
10	20	10	16	1½
12	24	12	19	1¼
14	28	14	21	1½
15	30		22¼	1½
16	32	16	23½	1½
18	36	18	25	1½
20	40	20	27½	1½
22	44	22	29½	1½
24	48	24	32	1½
26	52	26	34¼	2
28	56	28	36½	2½
30	60	30	38¾	2½
36	72	36	46	2½

Templates for drilling, page 650.

PRESSURE REGULATORS  
GENERAL DIMENSIONS



No. 962



No. 963

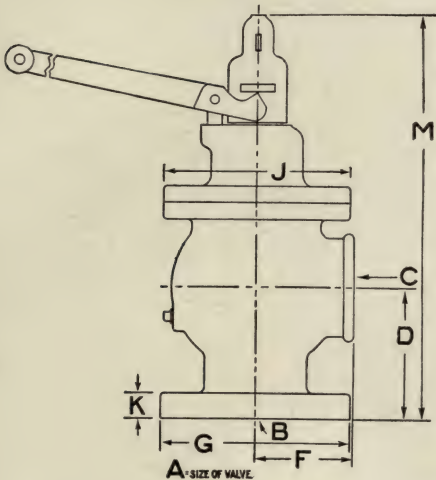
Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
A—Face to Face.....Inches							12
B—End to End.....Inches	7 7/16	8 3/8	9 1/8	9 3/4	10 3/4	12 1/8	
C—Diameter of Flanges.....Inches							7 1/2
D—Top to Bottom, Over All.....Inches	5 7/8	6 3/4	7 3/8	8 1/2	9 5/8	10 3/4	15
E—Center to Top.....Inches	3 3/4	4 3/8	4 7/8	5 1/2	6 3/16	6 1/2	9 1/8
F—Center to Outside of Pilot Valve.....Inches	5 1/4	6 3/8	6 5/8	6 5/8	6 5/8	6 7/8	9

Size.....Inches	3	3 1/2	4	5	6	8	10
A—Face to Face.....Inches	14	15 3/4	17	19 3/4	22 1/2	27 3/4	34
B—End to End.....Inches							
C—Diameter of Flanges.....Inches	8 1/4	9	10	11	12 1/2	15	17 1/2
D—Top to Bottom, Over All.....Inches	17 1/4	21	21 1/4	25 1/4	27	34	41
E—Center to Top.....Inches	10 1/4	12 1/2	12 3/4	15 7/8	16 7/8	21 1/4	25 1/2
F—Center to Outside of Pilot Valve.....Inches	9 5/8	10 1/4	10 7/8	11 1/2	12 1/8	14 3/8	16 5/8

# IRON BODY POP SAFETY VALVES

(CRANE PATENT)

## GENERAL DIMENSIONS



No. 1101

No. 1105

A—Size of Valve.....Inches	2½	3	3½	4	4½
B—Size of Inlet.....Inches	2½	3	3½	4	4½
C—Size of Outlet.....Inches	2½	3	3½	4	4½
D—Center to Face of Inlet.....Inches	5¼	5¾	6⅜	6⅞	7⅛
F—Center to End of Outlet, Scd.Inches	3⅞	4¼	4⅝	5	6
G—Diameter of Inlet Flange....Inches	7½	8¼	9	10	10½
J—Diameter of Bonnet Flange..Inches	7⅞	8⅛	8¾	9½	11
K—Thickness of Inlet Flange...Inches	1	1⅛	1⅜	1¼	1⅝
M—Height Over All.....Inches	16¼	17¾	20⅛	21¼	22⅝

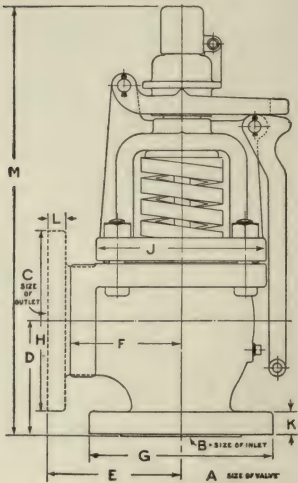
An additional charge will be made for special-diameter flanges. Drilling extra. For Price List, see page 152.

Templates for drilling should always accompany orders, otherwise we will drill the base (inlet) flange according to Extra Heavy Templates, page 652.

OUTSIDE SPRING AND YOKE  
POP SAFETY VALVES

(CRANE PATENT)

GENERAL DIMENSIONS



A—Size of Valve.....Inches	2½	3	3½	4	4½
B—Size of Inlet.....Inches	2½	3	3½	4	4½
C—Size of Outlet.....Inches	3	3½	4	4½	5
D—Center to Face of Inlet.....Inches	4¾	5⅜	6	6⅛	7⅛
E—Center to Face of Outlet....Inches	5½	6	6½	7	7½
F—Center to End of Outlet....Inches	4½	4⅞	5⅞	5¾	6⅞
G—Diameter of Inlet Flange...Inches	7½	8¼	9	10	10½
H—Diameter of Outlet Flange...Inches	7½	8½	9	9¼	10
J—Bonnet Flange.....Inches	7	7½	8½	9⅛	9⅝
K—Thickness of Inlet Flange...Inches	1	1⅛	1⅜	1¼	1⅝
L—Thickness of Outlet Flange...Inches	¾	⅞	⅞	⅞	⅞
M—Height Over All.....Inches	18¾	21¼	22¾	24¾	27

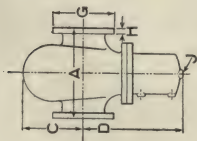
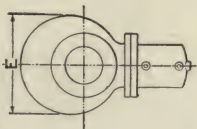
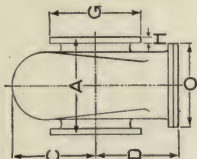
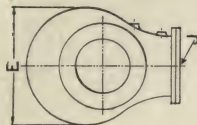
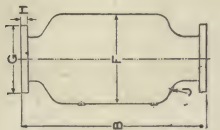
An additional charge will be made for special-diameter flanges. Drilling extra.

Templates for drilling should always accompany orders, otherwise we will drill the base (inlet) flange according to Extra Heavy Templates, page 652 and the outlet flange according to Standard Templates, page 650.



## LOW PRESSURE OIL SEPARATORS

## GENERAL DIMENSIONS



No. 01

10 INCH AND SMALLER

No. 03

12 INCH AND LARGER

No. 05

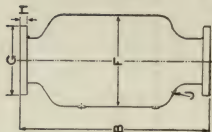
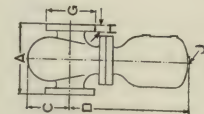
1½ TO 12 INCH, INCLUSIVE

Size.....	Inches	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	36
A—Face to Face, Horiz. ....	Ins.	10	10	11	12	14	14	16	16	17	20	20	23	23	20	23	25	25	27	30	32	34	36	38	40	46
B—Face to Face, Vert. ....	Ins.	27	27	27	29	31	31	33	33	38	41	41	44	44	47											
C—Center to Top, Horiz. ....	Ins.	4¾	4¾	5	6½	8	8	9¾	9¾	11½	14½	14½	18	18	18½	21½	23½	23½	27½	28½	31	35	37½	42¼	42¼	52½
D—Center to Bottom, Horiz. ....	Ins.	15	15	15½	16	16½	16½	18	18	18½	22	22	23½	23½	17	20	22½	22½	24¼	27¼	29½	29½	31	33	33	40
E—Diameter of Head, Horiz. ....	Ins.	7½	8	8¼	9½	11½	11½	15	15	16½	21	21	25	25	25½	30	33¾	33¾	38	42¼	46¾	50½	54½	63	63	81¾
F—Diameter of Body, Vert. ....	Ins.	11	11	11	12½	14	14	16	16	17½	20	20	23½	23½	27											
G—Diameter of Flanges. ....	Ins.	5	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32	34¼	36½	38¾	46
H—Thickness of Flanges. ....	Ins.	⅝	⅝	⅝	¾	⅞	⅞	⅞	⅞	1	1⅞	1⅞	1⅞	1⅞	1¼	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	1⅞	2	2⅞	2⅞	2⅞
J—Size of Drain. ....	Ins.	½	½	¾	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	2	2	2	2	2	2	2	2	3	3	3

FOR DRILLING TEMPLATES, SEE PAGE 660

# STANDARD STEAM SEPARATORS

## GENERAL DIMENSIONS



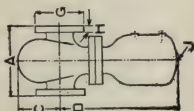
No. 07

No. 09

Size.....	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
A—Face to Face, Horizontal.....	Inches	10	10	11	12	14	16	16	17	20	20	23	23	26
B—Face to Face, Vertical.....	Inches	27	27	27	29	31	33	33	38	41	41	44	44	47
C—Center to Top, Horizontal.....	Inches	4¾	4¾	5	6½	8	9¾	9¾	11½	14½	14½	18	18	22
D—Center to Bottom, Horizontal.....	Inches	17	17	18½	20	22½	22½	26	28½	34¼	34¼	39½	39½	45
E—Diameter of Head, Horizontal.....	Inches	7½	8	8¼	9½	11½	11½	15	15	16½	21	25	25	29
F—Diameter of Body, Vertical.....	Inches	11	11	11	12½	14	16	16	17½	20	20	23½	23½	27
G—Diameter of Flanges.....	Inches	5	6	7	7½	8½	9	10	11	12½	13½	15	16	19
H—Thickness of Flanges.....	Inches	1⅞	5/8	1½	¾	1⅜	1½	1½	1	1⅞	1⅞	1⅞	1⅞	1¼
J—Size of Drain.....	Inches	1½	1½	¾	1	1	1	1¼	1¼	1¼	1¼	1½	1½	1½

# EXTRA HEAVY STEAM SEPARATORS

## GENERAL DIMENSIONS



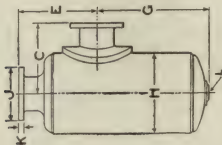
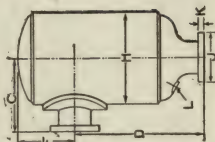
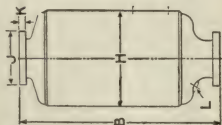
No. 011

No. 013

Size.....	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
A—Face to Face, Horizontal.....	Inches	10	11	12	14	14	16	16	17	20	20	23	23	26
B—Face to Face, Vertical.....	Inches	27	27	27	29	31	33	33	38	41	41	44	44	47
C—Center to Top, Horizontal.....	Inches	4¾	4¾	5	6½	8	9¾	9¾	11½	14½	14½	18	18	22
D—Center to Bottom, Horizontal.....	Inches	17	17	18½	20	22½	26	26	28½	34½	34½	39½	39½	45
E—Diameter of Head, Horizontal.....	Inches	7½	8	8¾	9½	11½	15	15	16½	21	21	25	25	29
F—Diameter of Body, Vertical.....	Inches	11	11	11	12½	14	16	16	17½	20	20	23½	23½	27
G—Diameter of Flanges.....	Inches	6	6½	7½	8¾	9	10	10½	11	12½	14	15	16¼	17½
H—Thickness of Flanges.....	Inches	1¾	7/8	1	1	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	2
J—Size of Drain.....	Inches	½	½	¾	1	1	1	1¼	1¼	1¼	1¼	1½	1½	1½

## EXTRA HEAVY RECEIVER STEAM SEPARATORS

## GENERAL DIMENSIONS



No. 014

No. 017

No. 019

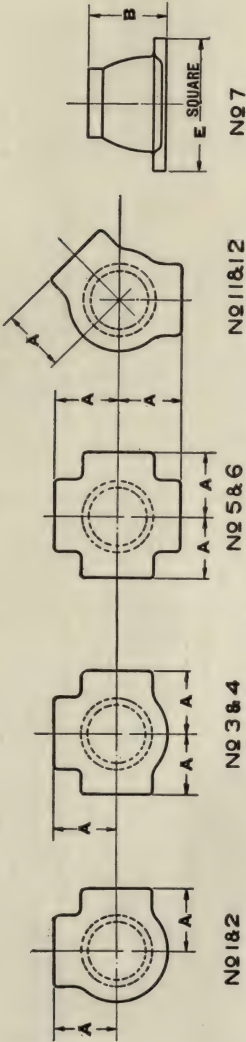
No. 020

Size.....	Inches	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20
A—Face to Face, Horizontal.....	Inches	36	39	39	42	45	48	53	55	61	67	67	70	77	85
B—Face to Face, Vertical.....	Inches	46		50	54	58	62	66	69	78	85	90	96	102	111
C—Center to Side Face, Angle.....	Inches	18	19 1/2	19 1/2	21	22 1/2	24	26 1/2	27 1/2	30 1/2	33 1/2	33 1/2	35	38 1/2	42 1/2
D—Center to Bottom Face, Angle.....	Inches	32 1/2	39 1/2	39 1/4	42 1/4	45	46	53	53	56 1/2	63 1/4	63 1/4	69	72 1/2	80
E—Center to Top Face, Angle.....	Inches	21	25	25	26 1/2	28 1/2	29 1/2	32 1/2	33	35 1/2	39 1/2	40	44 1/2	45	49
F—Center to Top.....	Inches	15 1/2	16 1/2	16 3/4	17 3/4	19	20	21	22	23 1/2	25 3/4	26 1/2	28 1/2	29 1/2	32
G—Center to Bottom.....	Inches	27	31	31	33 1/2	35 1/2	36 1/2	41 1/2	42	44 1/2	49 1/2	50	53	57	63
H—Diameter of Body.....	Inches	21	23	23	25	27	29	33	33	37	41	41	43	49	55
J—Diameter of Flanges.....	Inches	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2	25 1/2	28	30 1/2
K—Thickness of Flanges.....	Inches	1 1/4	1 5/16	1 3/8	1 7/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/8	2 1/4	2 3/8	2 1/2
L—Size of Drain.....	Inches	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2	2	2 1/2	3	3

FOR DRILLING TEMPLATES, SEE PAGE 652

BALL PATTERN RAILING FITTINGS

GENERAL DIMENSIONS

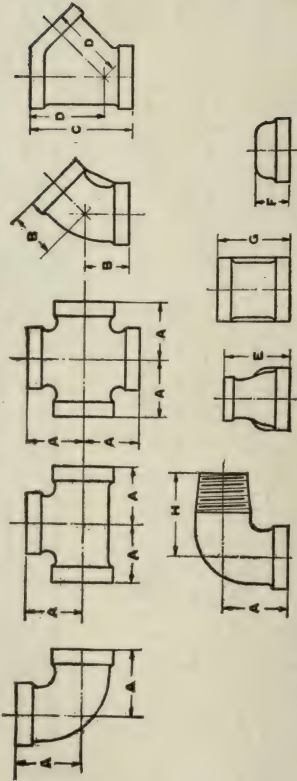


Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	1	1 1/8	1 7/16	1 3/4	1 11/16	2 1/4	2 11/16	3 1/8	3 11/16
B	1 3/16	1 1/2	1 3/4	2 3/16	2 1/2	2 15/16	3 7/16	3 7/8	4 5/16
E	2 1/16	2 1/2	3 9/32	4 5/8	4 3/4	5 3/4	6 11/16	8 1/4	10 1/8



STANDARD BRASS SCREWED FITTINGS

GENERAL DIMENSIONS

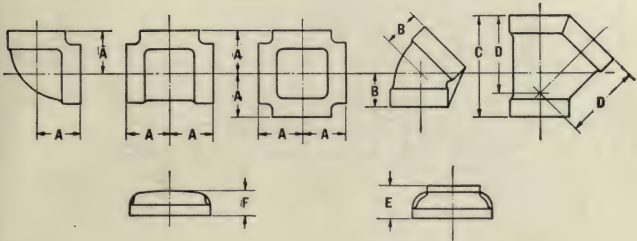


Size.....	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
A.....	Inches	9/16	1 1/8	1 1/4	1 5/8	1 7/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 7/8	5 3/4
B.....	Inches	1/2	5/8	3/4	1 1/8	1 1/4	1 5/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 7/8
C.....	Inches													
D.....	Inches													
E*.....	Inches													
F.....	Inches	7/16	1 1/8	1 1/4	1 5/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 7/8	5 3/4	6 1/4
G.....	Inches	7/8	1 1/8	1 1/4	1 5/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 7/8	5 3/4	6 1/4
H.....	Inches	1	1 1/8	1 1/4	1 5/8	2 1/8	2 3/8	2 7/8	3 1/8	3 5/8	4 1/8	4 7/8	5 3/4	6 1/4

\*For a reduction of one size only.

The above dimensions are subject to a slight variation and change without notice.

**GENERAL DIMENSIONS OF  
STANDARD  
CAST IRON  
SCREWED FITTINGS**

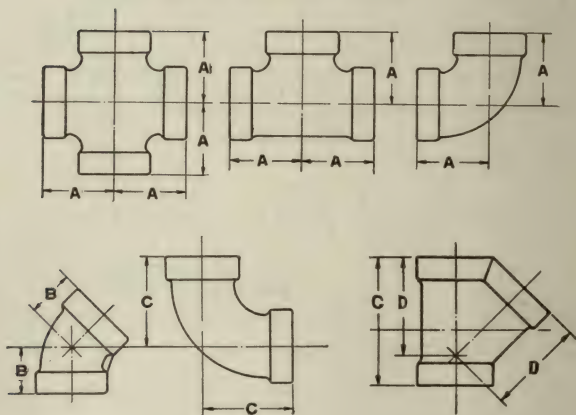
**CAP****REDUCERS  
REGULAR AND ECCENTRIC**

Size Inches	Dimensions A Inches	Dimensions B Inches	Dimension C Inches	Dimensions D Inches	Dimension E Inches	Dimension F Inches
$\frac{1}{4}$	$\frac{13}{16}$	$\frac{3}{4}$				
$\frac{3}{8}$	$\frac{15}{16}$	$\frac{13}{16}$				
$\frac{1}{2}$	$1\frac{1}{8}$	$\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{7}{8}$		
$\frac{3}{4}$	$1\frac{5}{16}$	1	3	$2\frac{1}{4}$		
1	$1\frac{1}{4}$	$1\frac{1}{8}$	$3\frac{1}{2}$	$2\frac{3}{4}$		
$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{5}{16}$	$4\frac{1}{4}$	$3\frac{1}{4}$	$2\frac{1}{8}$	
$1\frac{1}{2}$	$1\frac{11}{16}$	$1\frac{7}{16}$	$4\frac{7}{8}$	$3\frac{13}{16}$	$2\frac{1}{4}$	
2	$2\frac{1}{4}$	$1\frac{11}{16}$	$5\frac{3}{4}$	$4\frac{1}{2}$	$2\frac{7}{16}$	
$2\frac{1}{2}$	$2\frac{11}{16}$	$1\frac{15}{16}$	$6\frac{1}{4}$	$5\frac{3}{16}$	$2\frac{11}{16}$	
3	$3\frac{1}{8}$	$2\frac{3}{16}$	$7\frac{7}{8}$	$6\frac{1}{8}$	$2\frac{15}{16}$	
$3\frac{1}{2}$	$3\frac{7}{16}$	$2\frac{3}{8}$	$8\frac{7}{8}$	$6\frac{7}{8}$	$3\frac{1}{8}$	
4	$3\frac{3}{4}$	$2\frac{9}{8}$	$9\frac{3}{4}$	$7\frac{5}{8}$	$3\frac{3}{8}$	$2\frac{1}{16}$
$4\frac{1}{2}$	$4\frac{1}{16}$	$2\frac{13}{16}$	$10\frac{5}{8}$	$8\frac{1}{2}$	$3\frac{5}{8}$	$2\frac{3}{16}$
5	$4\frac{7}{16}$	$3\frac{1}{16}$	$11\frac{5}{8}$	$9\frac{1}{4}$	$3\frac{7}{8}$	$2\frac{3}{8}$
6	$5\frac{1}{8}$	$3\frac{7}{16}$	$13\frac{7}{16}$	$10\frac{3}{4}$	$4\frac{3}{8}$	$2\frac{5}{8}$
7	$5\frac{13}{16}$	$3\frac{7}{8}$	$15\frac{1}{4}$	$12\frac{1}{4}$	$4\frac{13}{16}$	$2\frac{7}{8}$
8	$6\frac{1}{2}$	$4\frac{1}{4}$	$16\frac{11}{16}$	$13\frac{5}{8}$	$5\frac{1}{4}$	$3\frac{1}{8}$
9	$7\frac{3}{8}$	$4\frac{11}{16}$	$20\frac{1}{16}$	$16\frac{3}{4}$	$5\frac{11}{16}$	$3\frac{3}{8}$
10	$7\frac{7}{8}$	$5\frac{3}{16}$	$20\frac{11}{16}$	$16\frac{3}{4}$	$6\frac{1}{16}$	$3\frac{5}{8}$
12	$9\frac{1}{4}$	6	$24\frac{1}{8}$	$19\frac{5}{8}$	$7\frac{7}{8}$	$4\frac{1}{4}$

The above dimensions are subject to a slight variation and change without notice.

# EXTRA HEAVY CAST IRON SCREWED FITTINGS

## GENERAL DIMENSIONS

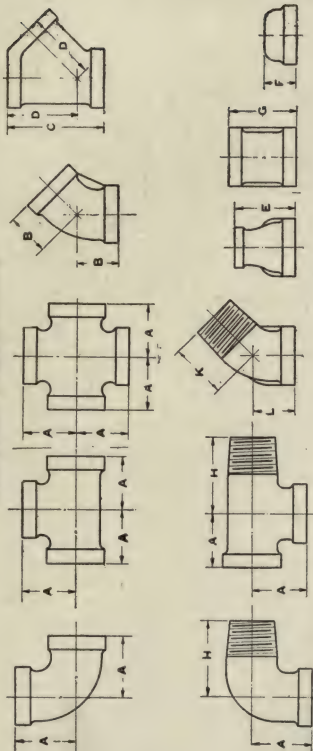


Size Inches	Dimensions A Inches	Dimensions B Inches	Dimensions C Inches	Dimensions D Inches
1	2	$1\frac{3}{8}$		
$1\frac{1}{4}$	$2\frac{1}{4}$	$1\frac{1}{2}$	$4\frac{7}{8}$	$3\frac{13}{16}$
$1\frac{1}{2}$	$2\frac{9}{16}$	$1\frac{5}{8}$	$5\frac{3}{4}$	$4\frac{1}{2}$
2	3	$1\frac{15}{16}$	$6\frac{1}{4}$	$5\frac{3}{16}$
$2\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{4}$	$7\frac{7}{8}$	$6\frac{1}{8}$
3	$4\frac{1}{8}$	$2\frac{1}{2}$	$8\frac{7}{8}$	$6\frac{7}{8}$
$3\frac{1}{2}$	$4\frac{11}{16}$	$2\frac{9}{16}$	$9\frac{3}{4}$	$7\frac{5}{8}$
4	$5\frac{1}{8}$	$2\frac{3}{4}$	$10\frac{5}{8}$	$8\frac{1}{2}$
$4\frac{1}{2}$	$5\frac{1}{2}$	3		
5	$6\frac{1}{8}$	$3\frac{5}{16}$		
6	$7\frac{1}{4}$	$3\frac{3}{4}$		
7	$8\frac{1}{8}$	4		
8	$9\frac{1}{8}$	$4\frac{3}{4}$		
10	$11\frac{3}{8}$	$4\frac{7}{8}$		
12	$13\frac{3}{8}$	$5\frac{1}{2}$		

The above dimensions are subject to a slight variation and change without notice.

# STANDARD MALLEABLE IRON SCREWED FITTINGS

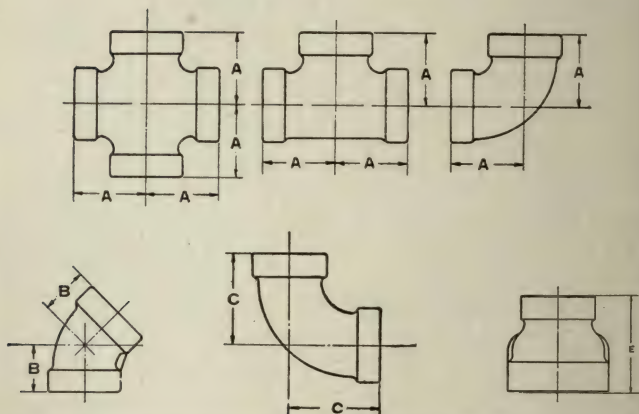
## GENERAL DIMENSIONS



Size.....	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
A.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	1 7/8	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 3/4	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
B.....	Inches	3/4	1	1 1/8	1 1/4	1 1/2	1 3/4	1 7/8	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	3 7/8	4 1/4
C.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
D.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
E.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
F.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
G.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
H.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
K.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2
L.....	Inches	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 3/8	4 1/8	4 1/4	5 1/8	5 1/2	6 1/2

The above dimensions are subject to a slight variation and change without notice.

**GENERAL DIMENSIONS OF  
EXTRA HEAVY HYDRAULIC  
MALLEABLE IRON  
SCREWED FITTINGS**



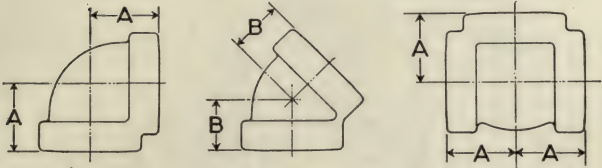
Size Inches	Dimensions A Inches	Dimensions B Inches	Dimensions C Inches	Dimensions E Inches
$\frac{1}{4}$	$1\frac{1}{16}$	$\frac{3}{4}$		
$\frac{3}{8}$	$1\frac{1}{4}$	$\frac{7}{8}$		$1\frac{7}{16}$
$\frac{1}{2}$	$1\frac{1}{2}$	1		
$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{8}$		$1\frac{3}{4}$
1	2	$1\frac{5}{16}$	$2\frac{1}{2}$	2
$1\frac{1}{4}$	$2\frac{1}{4}$	$1\frac{1}{2}$	3	$2\frac{3}{8}$
$1\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{11}{16}$
2	3	2	4	$3\frac{3}{16}$
$2\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{4}$	$4\frac{3}{4}$	
3	$4\frac{1}{8}$	$2\frac{1}{2}$	$5\frac{1}{2}$	
$3\frac{1}{2}$	$4\frac{5}{8}$	$2\frac{5}{8}$	$6\frac{1}{4}$	
4	$5\frac{1}{8}$	$2\frac{13}{16}$	7	
$4\frac{1}{2}$	$5\frac{5}{8}$		$7\frac{3}{4}$	
5	$6\frac{1}{4}$		$8\frac{1}{2}$	
6	$7\frac{1}{4}$		$9\frac{1}{2}$	

The above dimensions are subject to a slight variation and change without notice.



# EXTRA HEAVY HYDRAULIC FORGED STEEL SCREWED FITTINGS

## GENERAL DIMENSIONS



FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS PER SQUARE INCH HYDROSTATIC

No. 300 D, Elbows.  
No. 301 D, Reducing Elbows.  
No. 302 D, 45 Degree Elbows.  
No. 304 D, Tees.  
No. 306 D, Reducing Tees.

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
A—Center to End, Elbows and Tees. Ins.	$1\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{7}{16}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$2\frac{1}{4}$	$2\frac{11}{16}$
B—Center to End, 45 Degree Elbows. Ins.	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{11}{16}$	$2\frac{1}{16}$

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
6000 POUNDS PER SQUARE INCH HYDROSTATIC

No. 310 D, Elbows.  
No. 311 D, Reducing Elbows.  
No. 312 D, 45 Degree Elbows.  
No. 314 D, Tees.  
No. 316 D, Reducing Tees.

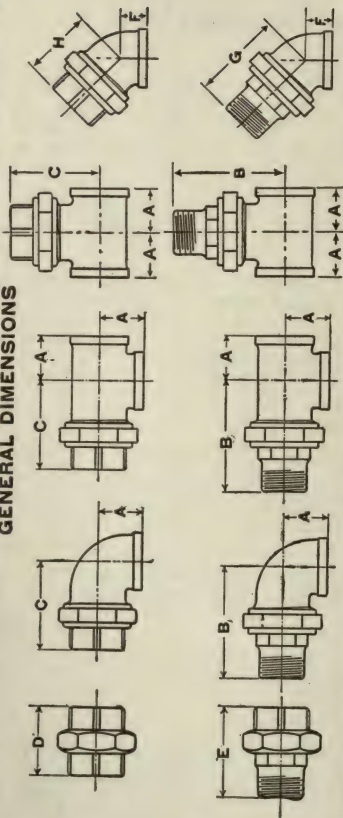
Size.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
A—Center to End, Elbows and Tees. Ins.	$1\frac{1}{8}$	$1\frac{5}{16}$	$1\frac{7}{16}$	$1\frac{3}{4}$	$1\frac{11}{16}$	$2\frac{1}{4}$	$2\frac{11}{16}$
B—Center to End, 45 Degree Elbows. Ins.	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{7}{16}$	$1\frac{11}{16}$	$2\frac{1}{16}$

## REDUCING FITTINGS

Reducing Fittings have the same center to face dimensions as straight size fittings.

# MALLEABLE IRON UNIONS, UNION ELBOWS AND UNION TEES

## GENERAL DIMENSIONS



Size.....	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
A—Center to End—Standard and Railroad.....	1 1/8	1 3/8	1 7/8	2 1/8	2 5/8	3 1/8	3 7/8	4 1/4	5 1/8	6			
B—Center to End—Standard and Railroad.....		2 7/16	1 1/2	2 1/4	2 5/8	3 1/8	3 7/8	4 1/4	5 1/8	6			
C—Center to End—Standard and Railroad.....		1 1/2	1 5/8	2 1/8	2 5/8	3 1/8	3 7/8	4 1/4	5 1/8	6			
D—End to End—Standard, Railroad and Chicago.....		1 1/2	1 5/8	2 1/8	2 5/8	3 1/8	3 7/8	4 1/4	5 1/8	6			
D—End to End—Navy.....													
D—End to End—Crane.....													
E—End to End—Standard and Railroad.....													
F—Center to End—Standard and Railroad.....													
G—End to End—Standard and Railroad.....													
H—Center to End—Standard and Railroad.....													

The above dimensions are subject to a slight variation and change without notice.

## AMERICAN STANDARD

## NAMES OF FITTINGS



ELBOW



REDUCING ELBOW



SIDE OUTLET ELBOW

DOUBLE BRANCH  
ELBOW

LONG RADIUS ELBOW



45° ELBOW



TEE



SINGLE SWEEP TEE



DOUBLE SWEEP TEE



SIDE OUTLET TEE



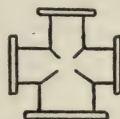
REDUCING TEE



REDUCER

REDUCING  
SINGLE SWEEP TEEREDUCING  
SIDE OUTLET TEE

CROSS



REDUCING CROSS



Y

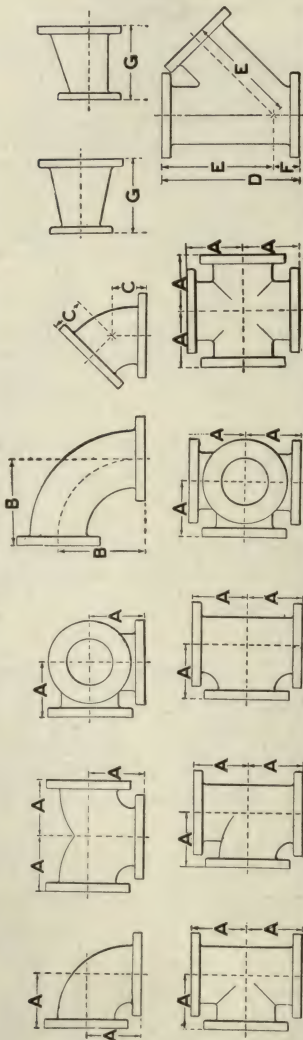


LATERAL



REDUCING LATERAL

# GENERAL DIMENSIONS OF STANDARD AND LOW PRESSURE FLANGED FITTINGS STRAIGHT SIZES



Size.....	In.	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20
A A—Face to Face, Tees and Crosses.	In.	7	7 1/2	8	9	10	11	12	13	14	15	16	17	18	20	22	24	28	29	30	33	36
A C—to F, Elbows, Tees and Crosses.	In.	3 1/2	3 3/4	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	11	12	14	14 1/2	15	16 1/2	18
B C—to F, Long Radius Elbows...	In.	5	5 1/2	6	6 1/2	7	7 3/4	8 1/2	9	9 1/2	10 1/4	11 1/2	12 3/4	14	15 1/4	16 1/2	19	21 1/2	22 3/4	24	26 1/2	29
C—Center to Face, 45° Elbows...	In.	1 3/4	2	2 1/4	2 1/2	3	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7 1/2	8	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	14
D—Face to Face, Laterals.	In.	7 1/2	8	9	10 1/2	12	13	14 1/2	15	15 1/2	17	18	20 1/2	22	24	25 1/2	30	33	34 1/2	36 1/2	39	43
E—Center to Face, Laterals	In.	5 3/4	6 1/4	7	8	9 1/2	10	11 1/2	12	12 1/2	13 1/2	14 1/2	16 1/2	17 1/2	19 1/2	20 1/2	24 1/2	27	28 1/2	30	32	35
F—Center to Face, Laterals	In.	1 3/4	1 3/4	2	2 1/2	2 1/2	3	3	3	3	3 1/2	4	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	14
G—Face to Face, Reducers.	In.	4	4 1/2	5	6	7	7 1/2	8 1/2	9	9 1/4	10	11	12 1/2	13 1/2	15	16	19	21	22 1/4	23 1/2	25	27 1/2
Diameter of Flanges	In.	7	7 1/2	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27
Thickness of Flanges	In.	1 1/8	1 1/4	1 1/2	1 3/8	1 1/2	1 3/4	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8

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## GENERAL DIMENSIONS OF

## STANDARD AND LOW PRESSURE FLANGED FITTINGS

## STRAIGHT SIZES

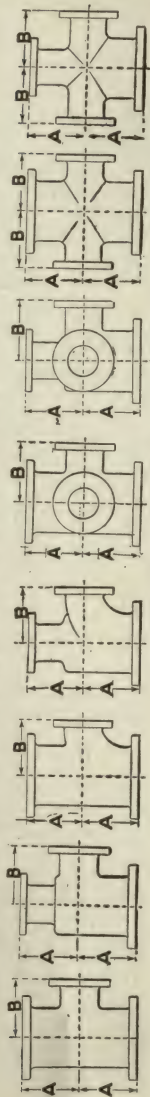
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Size.....	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
A-A Face to Face, Tees and Crosses. In.	40	44	46	48	50	52	54	56	58	60	62	64	66	68	70	74	78	82	84	88	90
A-C. to F., Elbows, Tees and Crosses. In.	20	22	23	24	25	26	27	28	29	30	31	32	33	34	35	37	39	41	42	44	45
B-C. to F., Long Radius Elbows. . . . In.	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64	66½	69	71½	74	76½	79	81½
C-Center to Face, 45° Elbows. . . . In.	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
D-Face to Face, Laterals. In.	46	49½	53	56	59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E-Center to Face, Laterals. . . . . In.	37½	40½	44	46½	49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F-Center to Face, Laterals. . . . . In.	8½	9	9	9½	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
G-Face to Face, Reducers. In.	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
Diameter of Flanges. . . . In.	29½	32	34½	36½	38¾	41¾	43¾	46	48¾	50¾	53	55¾	57¼	59½	61¾	64	66¼	68¾	71	73	75¾
Thickness of Flanges. . . . In.	1½	1¾	2	2½	2¾	2¾	2¾	2¾	2¾	2½	2½	2½	2½	2¾	2¾	2¾	3	3	3½	3½	3¾
Size.....	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	—	—
A-A Face to Face, Tees and Crosses. In.	94	96	100	102	106	108	112	116	118	120	124	126	130	134	136	138	142	146	148	—	—
A-C. to F., Elbows, Tees and Crosses. In.	47	48	50	51	53	54	56	58	59	60	62	63	65	67	68	69	71	73	74	—	—
B-C. to F., Long Radius Elbows. . . . In.	84	86½	89	91½	94	96½	99	101½	104	106½	109	111½	114	116½	119	121½	124	126½	129	—	—
C-Center to Face, 45° Elbows. . . . In.	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	—	—
G-Face to Face, Reducers. In.	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	—	—
Diameter of Flanges. . . . In.	78	80	82½	84½	86½	88½	90¾	93	95¼	97½	99¾	102	104½	106½	108¾	111	113½	115½	117¾	—	—
Thickness of Flanges. . . . In.	3¼	3¾	3¾	3¾	3½	3½	3½	3¾	3¾	3¾	3¾	4	4	4½	4½	4½	4½	4¾	4¾	—	—

Standard and Low Pressure Flanged Fittings are furnished plain faced unless otherwise ordered.



# STANDARD AND LOW PRESSURE FLANGED FITTINGS GENERAL DIMENSIONS REDUCING TEES AND CROSSES



## SHORT BODY PATTERN

Size.....In.	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30	32	34	36	38	40
*Size of Outlet & Smrl. In.																															
AA-F, to F., Run....In.																															
A-C, to F., Run ....In.																															
B-C, to F., Outlet...In.																															
Size.....In.	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	
Size of Outlet & Smrl. In.	28	28	30	32	32	34	36	36	38	40	40	42	44	44	46	48	48	50	52	52	54	56	56	58	60	60	62	64	64	66	
AA-F, to F., Run . . .In.	46	46	48	52	52	54	58	58	62	66	66	68	70	70	74	80	80	84	86	86	88	94	94	96	100	100	104	106	106	110	
A-O, to F., Run . . .In.	23	23	24	26	26	27	29	29	31	33	33	34	35	35	37	40	40	42	43	43	44	47	47	48	50	50	52	53	55		
B-O, to F., Outlet...In.	30	31	33	34	35	36	37	39	40	41	42	44	45	46	47	48	49	50	52	53	54	56	57	58	61	62	63	64	65	67	

{ All reducing fittings 1 inch to 16 inch, inclusive, have the same center to face dimensions as straight size fittings. }

**\*LONG BODY PATTERNS** {Are used when outlets are larger than given in the above table, therefore have same dimensions as straight size fittings. }

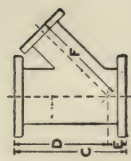
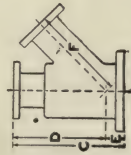
The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet.

**FITTINGS REDUCING ON THE RUN ONLY**, the long body pattern will always be used, EXCEPT DOUBLE SWEEP TEES, on which the reduced end is always longer than the regular fittings. Dimensions on request.

**BULL HEADS OR TEES** having outlets larger than the run, will be the same length center to face of all openings as a Tee with all openings of the size of the outlet. For example, a 12 x 18 inch Tee will be governed by the dimensions of the 18 inch Long Body Tee, namely, 16 1/2 inches center to face of all openings and 33 inches face to face.

**REDUCING ELBOWS** carry same center to face dimension as regular elbows of largest straight size.

STANDARD AND LOW PRESSURE FLANGED FITTINGS  
GENERAL DIMENSIONS REDUCING LATERALS



SHORT BODY PATTERN

Size.....	In.	1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24	26	28	30
*Size of Branch and Smaller..	In.																			9	10	10	12	12	14	15
C-Face to Face, Run.....	In.																			26	28	29	32	35	37	39
D-Center to Face, Run....	In.																			25	27	28½	31½	35	37	39
E-Center to Face, Run....	In.																			1	1	½	½	0	0	0
F-Center to Face, Branch..	In.																			27½	29½	31½	34½	38	40	42

{ All reducing fittings 1 to 16 inch, inclusive, have same }  
{ center to face dimensions as straight size fittings. }

**\*LONG BODY PATTERNS** {Are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.

The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.



## GENERAL DIMENSIONS

## EXTRA HEAVY FLANGED FITTINGS

## CAST IRON, FERROSTEEL AND CAST STEEL

## STRAIGHT SIZES

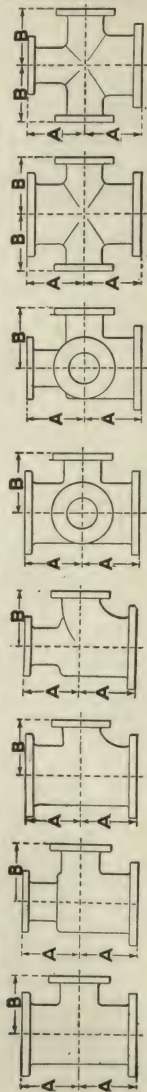
Size.....	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15
AA-Face to Face, Tees and Crosses... In.	8	8½	9	10	11	12	13	14	15	16	17	18	20	21	23	26	30	31
A-Center to Face, Elbows, Tees and Crosses..... In.	4	4¼	4½	5	5½	6	6½	7	7½	8	8½	9	10	10½	11½	13	15	15½
B-Center to Face, Long Radius Elbows... In.	5	5½	6	6½	7	7¾	8½	9	9½	10¼	11½	12¾	14	15¼	16½	19	21½	22¾
C-Center to Face, 45° Elbows..... In.	2	2½	2¾	3	3½	3¾	4	4½	4¾	5	5½	6	6	6½	7	8	8½	9
D-Face to Face, Laterals..... In.	8½	9½	11	11½	13	14	15½	16½	18	18½	21½	23½	25½	27½	29½	33½	37½	39½
E-Center to Face, Laterals..... In.	6½	7¼	8½	9	10½	11	12½	13½	14½	15	17½	19	20½	22½	24	27½	31	33
F-Center to Face, Laterals..... In.	2	2¼	2½	2½	2½	3	3	3	3½	3½	4	4½	5	5	5½	6	6½	6½
G-Face to Face, Reducers..... In.						6	6½	7	7½	8	9	10	11	11½	12	14	16	17
Diameter of Flanges..... In.	4½	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½
Thickness of Flanges..... In.	1½	¾	1¾	7/8	1	1½	1¾	1¾	1¾	1¾	1¾	1½	1½	1¾	1¾	2	2½	2½
Size.....	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
AA-Face to Face, Tees and Crosses... In.	33	36	39	41	45	48	52	55	58	61	65	68	71	74	78	81	84	
A-Center to Face, Elbows, Tees and Crosses..... In.	16½	18	19½	20½	22½	24	26	27½	29	30½	32½	34	35½	37	39	40½	42	
B-Center to Face, Long Radius Elbows... In.	24	26½	29	31½	34	36½	39	41½	44	46½	49	51½	54	56½	59	61½	64	
C-Center to Face 45° Elbows..... In.	9½	10	10½	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
D-Face to Face, Laterals..... In.	42	45½	49	53	57½													
E-Center to Face, Laterals..... In.	34½	37½	40½	43½	47½													
F-Center to Face, Laterals..... In.	7½	8	8½	9½	10													
G-Face to Face, Reducers..... In.	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
Diameter of Flanges..... In.	25½	28	30½	33	36	38½	40¾	43	45¼	47½	50	52¼	54½	57	59¼	61½	65	
Thickness of Flanges..... In.	2¼	2¾	2½	2½	2¾	2¾	2½	3	3½	3¼	3¾	3¾	3¾	3¾	3¾	3¾	4	



# EXTRA HEAVY FLANGED FITTINGS

## CAST IRON, FERROSTEEL AND CAST STEEL

### GENERAL DIMENSIONS REDUCING TEES AND CROSSES



#### SHORT BODY PATTERN

All reducing fittings 1 inch to 16 inch, inclusive, have the same center to face dimensions as straight size fittings.

Size.....	In.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
*Size of Outlet and Smaller.....	In.	12	14	15	16	18	18	20	20	22	24	24	26	28	28	30	32
AA-Face to Face, Run.....	In.	28	31	33	34	38	38	41	41	44	47	47	50	53	53	55	58
A-Center to Face, Run.....	In.	14	15½	16½	17	19	19	20½	20½	22	23½	23½	25	26½	26½	27½	29
B-Center to Face, Outlet.....	In.	17	18½	20	21½	23	24	25½	26½	28	29½	30½	31½	33½	34½	35½	37½

\***LONG BODY PATTERNS** {Are used when outlets are larger than given in the above table, therefore have same dimensions as straight size fittings.

The dimensions of "Reducing Flanged Fittings" are always regulated by the reduction of the outlet.

**FITTINGS REDUCING ON THE RUN ONLY**, the long body pattern will always be used, EXCEPT DOUBLE SWEEP TEES, on which the reduced end is always longer than the regular fitting. Dimensions on request.

**BULL HEADS OR TEES** having outlets larger than the run, will be the same length center to face of all openings as a Tee with all openings of the size of the outlet. For example, a 12 x 12 x 18 inch Tee will be governed by the dimensions of the 18 inch Long Body Tee, namely, 18 inches center to face of all openings and 36 inches face to face.

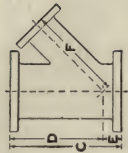
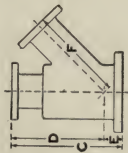
**REDUCING ELBOWS** carry same center to face dimension as regular elbows of largest straight size.



# EXTRA HEAVY FLANGED FITTINGS

## CAST IRON, FERROSTEEL AND CAST STEEL

### GENERAL DIMENSIONS REDUCING LATERALS



#### SHORT BODY PATTERN

Size.....In.	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20	22	24
*Size of Branch and Smaller. In.																				9	10	10	12
C—Face to Face, Run...In.																				34	37	40	44
D—Center to Face, Run...In.																				31	34	37	41
E—Center to Face, Run...In.																				3	3	3	3
F—Center to Face, Branch. In.																				32 1/2	36	39	43

{All reducing fittings 1 to 16 inch, inclusive, have same center to face }  
 {dimensions as straight size fittings. }

**\*LONG BODY PATTERNS** {Are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings. }

The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

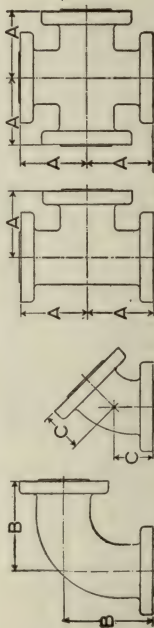
# EXTRA HEAVY HYDRAULIC FERROSTEEL FLANGED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

$1\frac{1}{2}$  TO  $2\frac{1}{2}$  INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  $4\frac{1}{2}$  TO 12 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE

## GENERAL DIMENSIONS OF STRAIGHT SIZES



Size.....	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
AA—Face to Face, Tees and Crosses.....	11	12	13	15	16	17	19	20	22	23	25	27	30	33
A—Center to Face, Tees and Crosses.....	5½	6	6½	7½	8	8½	9½	10	11	11½	12½	13½	15	16½
B—Center to Face, Elbows.....	7¼	8	8¾	9½	10	10¾	12½	13¾	15	16½	17¾	20¾	22¾	24¾
C—Center to Face, 45° Elbows.....	3¼	3½	4	4½	5	5½	5½	6	6½	7	7¼	7¾	8½	9½
Diameter of Flanges.....	6½	7½	8¾	10	10¾	11½	12½	13½	15	16	17	18½	21	23½
Thickness of Flanges.....	1½	1¼	1¾	1¾	1½	1½	1½	1¾	2½	2¼	2¾	2¾	2¾	3½

## EXTRA HEAVY HYDRAULIC FLANGED FITTINGS

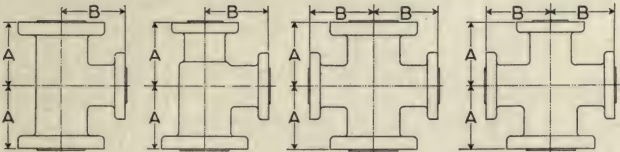
### FERROSTEEL

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
4½ TO 12 INCH, 800 LBS. HYDROSTATIC

TESTED TO 2000 POUNDS HYDRAULIC PRESSURE

### GENERAL DIMENSIONS OF REDUCING TEES AND CROSSES



### SHORT BODY PATTERN

All reducing fittings 1½ inch to 7 inch, inclusive, have the same center to face dimensions as straight size fittings.

Size.....Inches	8	9	10	12
*Size Outlet.....Inches	4½ and Smaller	4½ and Smaller	5 and Smaller	6 and Smaller
A—Center to Face of Run..Inches	10	10½	11	12
B—Center to Face of Outlet. Inches	12	13	14	15½

\***LONG BODY PATTERNS** { Are used when outlets are larger than given in the above table, therefore have same dimensions as straight size fittings.

Reducing Tees having outlet larger than the run will be governed by the dimensions of the Tee corresponding to the largest opening, for example: A 6×6×8 inch Tee will have the dimensions of an 8 inch Long Body Tee, namely, 12½ inches center to face of all openings.

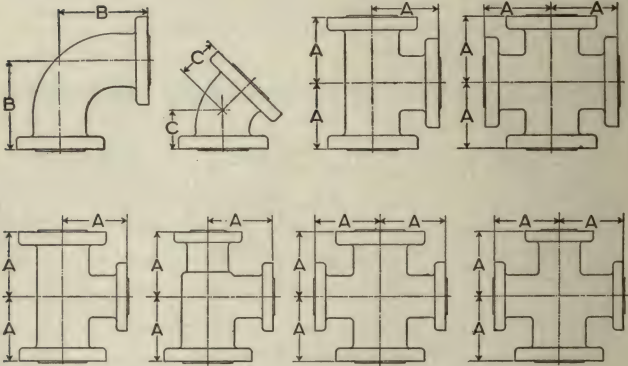
The length, Center to Face and Face to Face of Male or Female, Extra Heavy Hydraulic Flanged Fittings is measured from Face of Flange and not from Tongue or Recess.

Dimensions of Male and Female Faces, page 719. Templates for drilling, page 653.

EXTRA HEAVY HYDRAULIC  
CAST STEEL FLANGED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC

GENERAL DIMENSIONS  
STRAIGHT AND REDUCING



Size.....Inches	1½	2	2½	3	4	5	6
Inside Diameter of Port.....Inches	1¼	1½	2	2½	3	4	5
A—Center to Face, Tees and Crosses...Inches	5½	6	6½	7½	8½	10	11
B—Center to Face, Elbows.....Inches	7¼	8	8¾	9½	10¾	13¾	15
C—Center to Face, 45° Elbows...Inches	3¼	3½	4	4½	5¼	6	6½
Diameter of Flanges.....Inches	6½	7½	8¾	10	11½	13½	15

The inside diameter of these fittings is approximately the same as that of Double Extra Strong Pipe.

The dimensions of Reducing Fittings, sizes up to and including 6 inch, do not change by any reduction in the size of run or outlet.

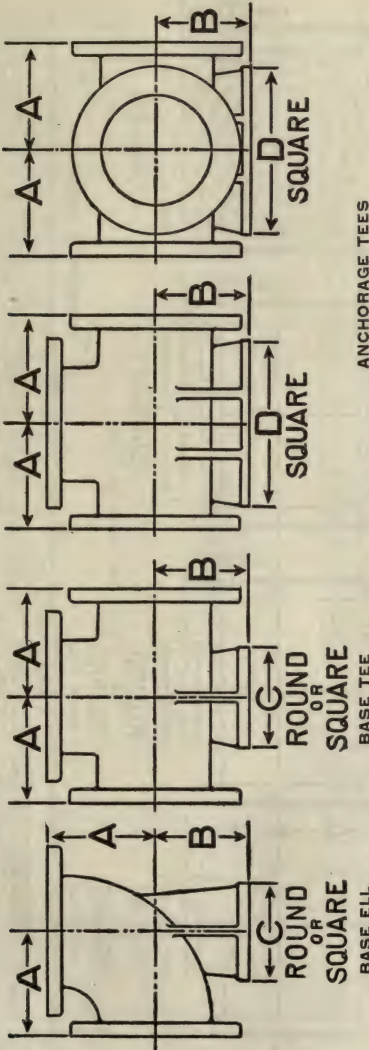
Reducing Tees having outlet larger than the run will be governed by the dimensions of the Tee corresponding to the largest opening, for example: A 4×4×6 inch Tee will have the dimensions of a 6 inch Tee, namely, 11 inches center to face of all openings.

The length, Center to Face and Face to Face of Male or Female, Extra Heavy Hydraulic Flanged Fittings is measured from Face of Flange and not from Tongue or Recess.

Dimensions of Male and Female Faces, page 720.    Templates for drilling, page 654.

# LOW PRESSURE AND STANDARD BASE AND ANCHORAGE FITTINGS

## GENERAL DIMENSIONS



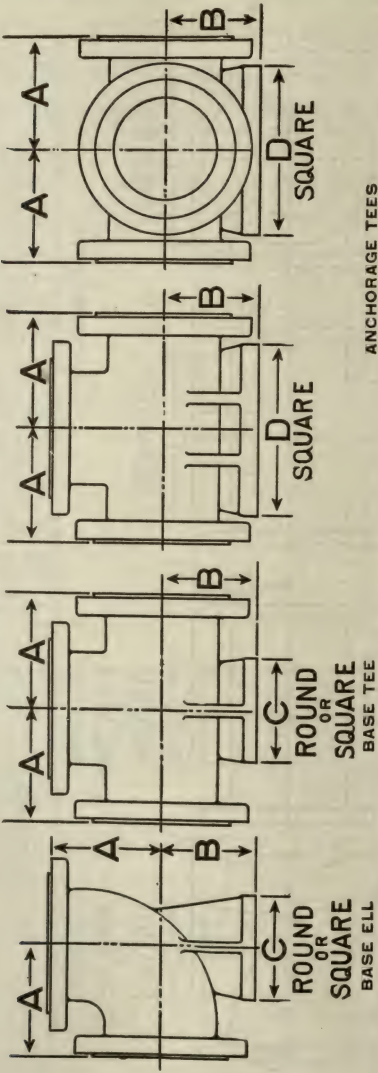
## ANCHORAGE TEES

Size.....	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—Center to Face, Ells and Tees.....	Inches 6½	7	7½	8	8½	9	10	11	12	14	14½	15	16½	18	20	22
B—Center to Face, Base Flange.....	Inches 6½	6¾	7	7½	8¼	8¾	9½	10	10½	13½	14	14¾	15½	16¾	17¾	18¾
C—Base Flange—Across Flats of Square or Diam. of Round, Inches	6	6	7	7	7	9	9	9	11	11	11	11	13½	13½	13½	13½
D—Anchorage Flange, Across Flats of Square.....	Inches 9	9¾	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32
Size of Pipe Support for Round Base Flange.....	Inches 2	2	2½	2½	2½	4	4	4	6	6	6	6	8	8	8	8

FOR OTHER DIMENSIONS, SEE PAGES 702 TO 705



EXTRA HEAVY  
BASE AND ANCHORAGE FITTINGS  
CAST IRON, FERROSTEEL AND CAST STEEL  
GENERAL DIMENSIONS



ANCHORAGE TEES

Size.....	4	4½	5	6	7	8	9	10	12	14	15	16
A—Center to Face, Ells and Tees..... Inches	7	7½	8	8½	9	10	10½	11½	13	15	15½	16½
B—Center to Face, Base Flange..... Inches	7	7¼	7½	8	8¾	9¾	10	10½	11	14	14½	15¼
C—Base Flange—Across Flats of Square or Diam. of Round, Ins.	6½	6½	7½	7½	7½	10	10	10	12½	12½	12½	12½
D—Anchorage Base, Across Flats of Square..... Inches	10	10½	11	12½	14	15	16	17	19	22½	23½	25
Size of Pipe Support for Round Base..... Inches	2	2	2½	2½	2½	4	4	4	6	6	6	6

FOR OTHER DIMENSIONS, SEE PAGES 706 TO 709

## STANDARD COMPANION FLANGES

CAST IRON, FERROSTEEL, FORGED STEEL AND MALLEABLE IRON

## GENERAL DIMENSIONS

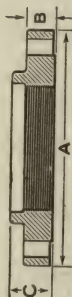


Size . . . . . Inches	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—Diameter of Flange . Inches	3½	4	4½	5	6	7	7½	8½	9	9½	10	11	12½	13½	15	16	19	21	22¼	23½	25	27½	29½	32
B—Thickness of Flange . Inches	⅞	1	1½	1⅞	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
C—Length of Hub . . . . Inches	5/8	¾	¾	7/8	1	1⅛	1½	1⅞	2	2¼	2½	3	3½	4	4½	5	6	7	8	9	10	11	12	13

## EXTRA HEAVY COMPANION FLANGES

CAST IRON, MALLEABLE IRON, FERROSTEEL, CAST STEEL, FORGED STEEL

## GENERAL DIMENSIONS



Size.....Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—Diameter of Flange. Inches	4½	5	6	6½	7½	8¼	9	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
B—Thickness of Flange. Inches	1½	¾	1½	7⁄8	1	1⅛	1⅜	1¾	1⅝	1⅜	1⅞	1½	1⅝	1¾	1⅞	2	2⅛	2⅜	2¼	2⅝	2½	2⅝	2¾
C—Length of Hub... Inches	1	1⅛	1¼	1⅜	1⅞	1⅞	1⅞	1¾	1⅞	1⅞	2	2⅞	2⅞	2¼	2⅝	2⅞	2⅞	2⅞	2⅞	3⅞	3¼	3⅞	3⅝

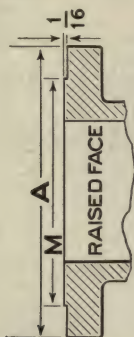
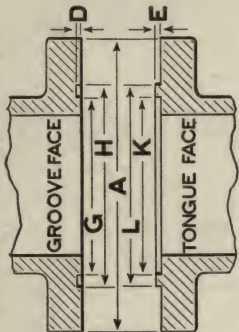
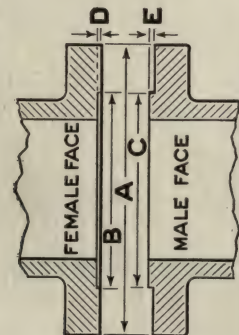
TEMPLATES FOR DRILLING, PAGE 652

FOR DIMENSIONS OF SPECIAL FACINGS, SEE PAGE 717

# EXTRA HEAVY FLANGES

CAST IRON, FERROSTEEL AND CAST STEEL

GENERAL DIMENSIONS OF VARIOUS FACINGS

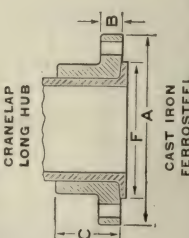
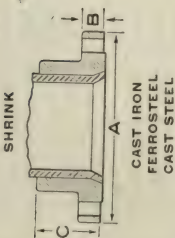
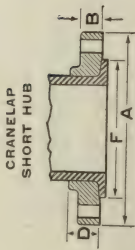
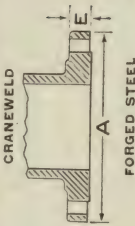
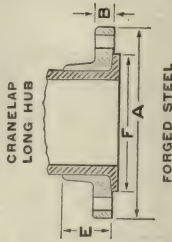
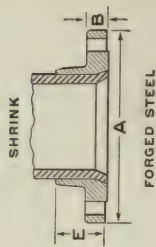


Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—Diameter of Flange.....Inches	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2	25 1/2	28	30 1/2	33	36
B—Diameter Recess, Female.....Inches	2 3/8	2 1/2	3 1/8	3 1/4	4 1/8	5 1/8	5 1/2	6 1/8	6 1/4	7 1/8	8 1/8	9 1/8	10 1/8	11 1/8	12 1/8	15 5/8	16 1/8	17 1/8	18 1/8	21 1/8	23 1/8	25 1/8	27 1/8
C—Diameter of Male.....Inches	2 1/8	2 3/4	3 1/8	3 5/8	4 1/8	5	5 1/2	6	6 1/2	7 1/4	8 3/8	9 3/8	10 5/8	11 5/8	12 3/4	15 1/4	16 1/4	17 1/2	18 1/2	21	23	25 1/2	27 1/2
D—Depth of Recess.....Inches	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
E—Height of Face.....Inches	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
G—Inside Diameter Groove.....Inches	1 1/8	2 1/8	2 1/8	3 1/8	3 1/8	4 1/8	4 1/8	5 1/8	5 1/8	6 1/8	7 1/8	8 1/8	9 1/8	10 1/8	11 1/8	13 3/8	15 1/8	15 1/8	17 1/8	18 1/8	20 1/8	22 1/8	24 1/8
H—Outside Diameter Groove.....Inches	2 1/8	3 1/8	3 1/8	4 1/8	4 1/8	5 1/8	5 1/8	6 1/8	6 1/8	7 1/8	8 1/8	9 1/8	10 1/8	11 1/8	12 1/8	15 3/8	17 1/8	18 1/8	20 1/8	22 1/8	24 1/8	26 1/8	28 1/8
K—Inside Diameter Tongue.....Inches	1 3/4	2 1/8	2 3/4	3 1/8	3 5/8	4 1/4	4 3/4	5 1/4	5 5/4	6 1/4	7 1/2	8 5/8	9 5/8	10 5/8	11 5/8	13 5/8	15 7/8	17 1/8	18 3/8	20 3/8	22 1/8	24 1/8	26 1/2
L—Outside Diameter Tongue.....Inches	2 1/2	3	3 5/8	4 1/8	4 5/8	5 1/4	5 3/4	6 1/4	6 3/4	7 1/4	8 1/2	9 5/8	10 7/8	11 7/8	13 1/8	15 1/8	17 3/8	18 5/8	20 1/8	22 3/8	24 1/8	26 1/2	28 1/2
M—Diameter of Raised Face.....Inches	2 1/8	3 1/8	4 1/8	4 1/8	4 1/8	5 1/8	6 1/8	6 1/8	7 1/8	8 1/8	9 1/8	10 1/8	11 1/8	12 1/8	14 1/8	16 1/8	18 1/8	20 1/8	21 1/8	23 1/8	25 1/8	27 1/8	30 1/8

FOR DRILLING TEMPLATES, SEE PAGE 652

# EXTRA HEAVY FLANGES

CRANEWELD CRANEWELD SHRINK  
GENERAL DIMENSIONS



Size.....	4	4½	5	6	7	8	9	10	12	14	15	16	18	20	22	24
A—Diameter of Flange.....	10	10½	11	12½	14	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
B—Thickness of Flange.....	1¼	1½	1¾	1¾	1¾	1¾	1¾	1¾	2	2½	2¾	2¾	2¾	2¾	2¾	2¾
C—Length of Hub, Regular.....	3¾	3¾	4½	4½	4½	4½	4½	4½	5½	5½	5½	6	6¼	6¼	6¼	7¼
D—Length of Hub, Short.....	1¾	1¾	1¾	2	2	2	2	2	2½	2½	2½	2½	3½	3½	3½	3½
E—Length of Hub, Forged Steel.....	3¼	3¼	3¾	3¾	3¾	3¾	3¾	3¾	4¾	4¾	4¾	5½	5½	5½	6¼	6¼
F—Diameter of Lap.....	6½	7¼	7¾	9	10	11	12¼	13½	15¾	17¾	18½	19½	21½	23½	25½	27½

For dimensions of special facings for Shrink Flanges, see page 717.

Templates for drilling, page 652.



# EXTRA HEAVY HYDRAULIC COMPANION FLANGES

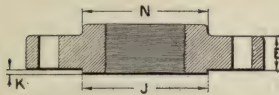
FERROSTEEL

MALE OR FEMALE

## GENERAL DIMENSIONS

FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS:

1½ TO 2½ INCH, 1200 LBS. HYDROSTATIC; 3 TO 4 INCH, 1000 LBS. HYDROSTATIC;  
4½ TO 12 INCH, 800 LBS. HYDROSTATIC



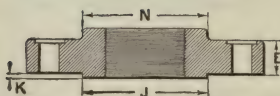
Size . . . . .	Inches	1½	2	2½	3	3½	4	4½
B—Diameter of Flange . . . . .	Inches	6½	7½	8¾	10	10¾	11½	12½
E—Thickness of Flange . . . . .	Inches	1⅞	1¼	1⅝	1⅞	1⅞	1⅞	1⅞
L—Diameter of Female . . . . .	Inches	3⅞	3⅞	4⅞	5⅞	5⅞	6⅞	6⅞
M—Depth of Female . . . . .	Inches	⅞	⅞	⅞	⅞	⅞	⅞	⅞
J—Diameter of Male . . . . .	Inches	3⅞	3⅞	4⅞	5	5½	6	6½
K—Thickness of Male . . . . .	Inches	⅞	⅞	⅞	⅞	⅞	⅞	⅞
N—Diameter of Hub . . . . .	Inches	3¼	3¾	4¼	4⅞	5½	6	6⅞
Size . . . . .	Inches	5	6	7	8	9	10	12
B—Diameter of Flange . . . . .	Inches	13½	15	16	17	18½	21	23½
E—Thickness of Flange . . . . .	Inches	1⅞	2⅞	2¼	2⅞	2⅞	2¾	3⅞
L—Diameter of Female . . . . .	Inches	7⅞	8⅞	9⅞	10⅞	11⅞	12⅞	15⅞
M—Depth of Female . . . . .	Inches	⅞	⅞	⅞	⅞	⅞	⅞	⅞
J—Diameter of Male . . . . .	Inches	7¼	8⅞	9⅞	10⅞	11⅞	12¾	15¼
K—Thickness of Male . . . . .	Inches	⅞	⅞	¼	¼	¼	¼	¼
N—Diameter of Hub . . . . .	Inches	7¼	8⅞	9½	10⅞	11⅞	13	15½

Templates for drilling, page 653.

# EXTRA HEAVY HYDRAULIC CAST STEEL COMPANION FLANGES

## GENERAL DIMENSIONS

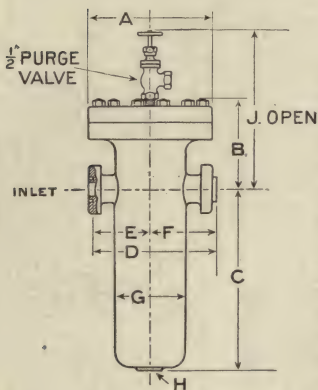
FOR COLD WATER OR OIL WORKING PRESSURES UP TO  
3000 POUNDS HYDROSTATIC



Size.....Inches	1½	2	2½	3	4	5	6
B—Diameter of Flange.....Inches	6½	7½	8¾	10	11½	13½	15
E—Thickness of Flange.....Inches	⅞	1	1⅛	1¼	1⅜	1⅝	1⅞
L—Diameter of Female.....Inches	2⅝	2⅞	3⅜	4	5⅛	6¼	7⅝
M—Depth of Female.....Inches	⅛	⅛	⅛	⅛	⅛	⅛	⅛
J—Diameter of Male.....Inches	2¼	2¾	3⅝	3⅞	5	6⅜	7¼
K—Thickness of Male.....Inches	⅜	⅜	⅜	⅜	⅜	⅜	⅜
N—Diameter of Hub.....Inches	2⅞	3⅝	4	4⅝	5¾	6¾	7⅞

Templates for drilling, page 654.

DIMENSIONS OF  
OIL SEPARATORS  
FOR AMMONIA

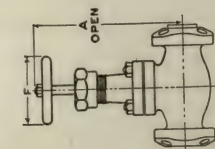


Style of Flange	Size Inches	A Diam. Top Flange Inches	B Cent. of Run to Top Inches	C Cent. of Run to Bottom Inches	D Face to Face Inches	E Cent. to Face, Groove End Inches	F Cent. to Face, Tongue End Inches	G Diam. Body Inches	H Size of Drain Inches	J Cent. of Run to Top of Purge Valve, Open Inches
OVAL	3/4	7 1/2	5 3/4	11	7 5/8	3 5/8	4	4 1/4	1/2	14 1/4
S Q U A R E	1	11	7	12	11 1/8	5 1/8	5 1/8	7	1/2	15 1/2
	1 1/4	11	7	12	11 1/8	5 1/8	5 1/8	7	1/2	15 1/2
	1 1/2	12 1/2	8 1/2	22 1/2	14 3/16	6 3/4	7 7/16	9	3/4	17 1/4
	2	12 1/2	8 1/2	22 1/2	14 3/16	6 3/4	7 7/16	9	3/4	17 1/4
	2 1/2	12 1/2	8 1/2	22 1/2	14 3/16	6 3/4	7 7/16	9	3/4	17 1/4
R O U N D	3	16	11 3/8	25 3/4	18 1/16	9	9 1/16	12	1	19 3/4
	3 1/2	16	11 3/8	25 3/4	18 1/16	9	9 1/16	12	1	19 3/4
	4	16	11 3/8	25 3/4	18 1/16	9	9 1/16	12	1	19 3/4
	5	20	13 3/8	35 3/4	24 3/16	11 3/4	12 7/16	16	1 1/4	21 3/4
	6	20	13 3/8	35 3/4	24 3/16	11 3/4	12 7/16	16	1 1/4	21 3/4

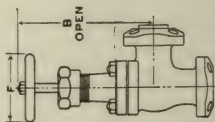
# OUTSIDE DIMENSIONS OF

## GLOBE, ANGLE AND EXPANSION VALVES

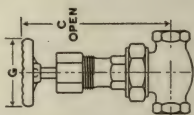
FOR AMMONIA



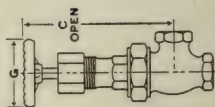
GLOBE



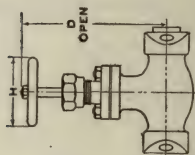
ANGLE



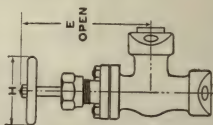
REGROUND  
GLOBE



REGROUND  
ANGLE



EXPANSION  
GLOBE



EXPANSION  
ANGLE

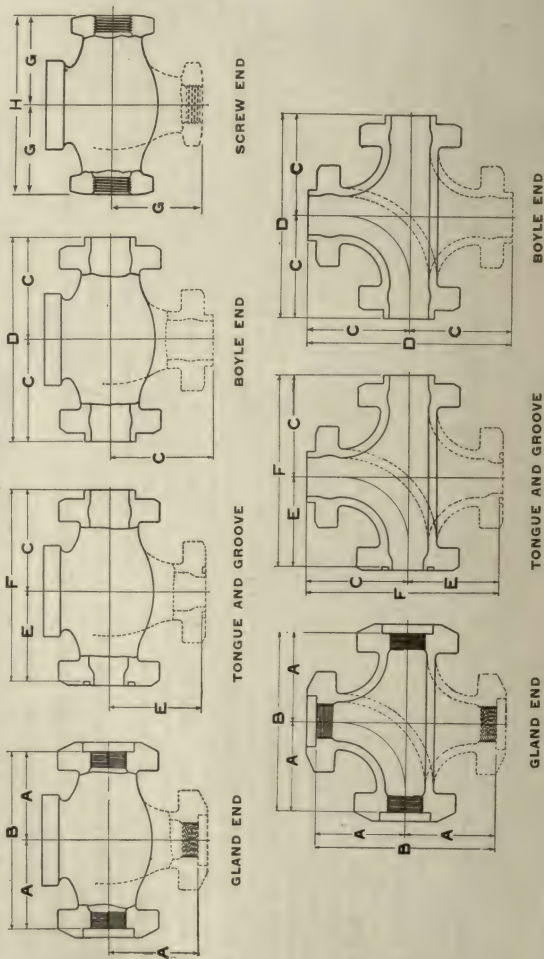
Size of Valve.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
A—1501, 1504 Globes.....Inches	$7\frac{3}{16}$	$7\frac{3}{16}$	$7\frac{3}{16}$	$9\frac{1}{16}$	$9\frac{3}{16}$	$11\frac{1}{16}$	$11\frac{5}{16}$	$12\frac{1}{4}$	$12\frac{5}{8}$	$14\frac{1}{8}$	$14\frac{3}{8}$	$16\frac{1}{8}$	$16\frac{1}{8}$	20
B—1503, 1505 Angles.....Inches	$6\frac{3}{4}$	$6\frac{3}{4}$	$6\frac{3}{4}$	$8\frac{5}{8}$	$8\frac{5}{8}$	$10\frac{1}{8}$	$10\frac{1}{4}$	$10\frac{1}{8}$	$11\frac{1}{4}$	$12\frac{7}{8}$	$13\frac{1}{8}$	$14\frac{5}{8}$	$15\frac{1}{8}$	$17\frac{1}{8}$
C—1504 $\frac{1}{2}$ , 1505 $\frac{1}{2}$ Regrinding Globes and Angles.....Inches	$6\frac{1}{8}$	$6\frac{1}{2}$	$6\frac{5}{8}$	$8\frac{3}{16}$	$8\frac{3}{4}$									
D—1511, 1513, 1519, 1519 $\frac{1}{2}$ Expansion Globes.....Inches	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$									
E—1515, 1517, 1519 $\frac{1}{4}$ , 1519 $\frac{3}{4}$ Expansion Angles.....Inches	7	7	7	7	7									
F—1501, 1503, 1504, 1505 Globes and Angles.....Inches	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{3}{8}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	9	10	12	14
G—1504 $\frac{1}{2}$ , 1505 $\frac{1}{2}$ Regrinding Globes and Angles.....Inches	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{5}{8}$									
H—1511, 1513, 1515, 1517, 1519, 1519 $\frac{1}{4}$ , 1519 $\frac{3}{4}$ Expansion Globes and Angles.....Inches	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$									

For other dimensions, see page 725.

For dimensions of Valves larger than 6 inch, see page 726.



# CENTER-TO-FACE AND FACE-TO-FACE DIMENSIONS OF ALL VALVES AND FITTINGS FOR AMMONIA 6 INCH AND SMALLER



Style of Flange. ....	OVAL				SQUARE				ROUND				
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Size of Valve or Fitting. ....													
A—Center to Face of Screw-gland End Valves, Elbows, Tees or Crosses. Inches	2 1/4	2 3/8	2 1/2	2 3/4	3 1/8	3 3/8	3 3/4	4 1/4	4 3/4	6	6 1/2	7 3/4	8 3/4
B—Face to Face of Screw-gland End Valves, Tees or Crosses. .... Inches	4 1/2	4 3/4	5	5 1/2	6 1/4	6 3/4	7 1/2	8 1/2	9 1/2	12	13	13 3/4	17 1/2
C—Center to Face of Tongue End Valves, Elbows, Tees or Crosses. . Inches	2 7/8	3	3 1/8	3 3/8	3 11/16	4	4 3/8	4 7/8	5 9/16	6 1/8	7 5/16	8 11/16	9 11/16
*D—Face to Face of Boyle End Valves, Tees or Crosses. .... Inches	5 3/4	6	6 1/4	6 3/4	7 1/8	8	8 3/4	9 3/4	11 1/8	13 5/8	14 5/8	17 3/8	19 3/8
E—Center to Face of Groove End Valves, Elbows, Tees or Crosses. . Inches	2 7/16	2 9/16	2 1 1/8	2 1 5/8	3 1/8	3 3/8	3 3/4	4 1/4	4 3/4	6	6 1/2	7 3/4	8 3/4
F—Face to Face of Tongue and Groove Valves, Tees or Crosses. .... Inches	5 5/16	5 9/16	5 1 1/8	5 1 5/8	6 1/16	6 3/8	6 1/2	7 1/8	8 1/8	10 5/16	12 1/8	14 5/16	16 7/16
G—Center to End of Plain Screw Valves. .... Inches	2 1/4	2 3/8	2 1/2	2 3/4	3 1/8	3 3/8	3 3/4	4 1/4					
H—End to End of Plain Screw Valves. .... Inches	4 1/2	4 3/4	5	5 1/2	6 1/4	6 3/4	7 1/2	8 1/2					

**NOTE.**—ON TONGUE AND GROOVE VALVES THE GROOVE END IS ON THE END NEXT TO THE UNDER SIDE OF DISC; AND THE TONGUE END OR ENDS ON THE END OR ENDS NEXT TO THE UPPER SIDE OF DISC.

\*Made to order only.

For other dimensions, see page 723.

Templates for drilling, page 731.

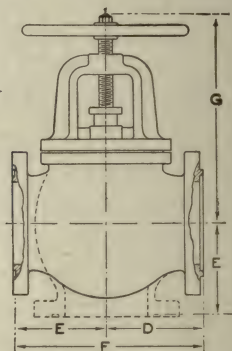
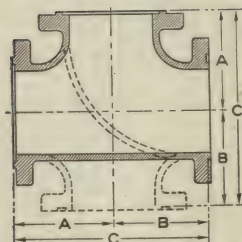
For sizes 7 inch and larger, see page 726.

CENTER-TO-FACE AND FACE-TO-FACE  
DIMENSIONS OF

**ALL VALVES AND FITTINGS**

FOR AMMONIA

**7 INCH AND LARGER**



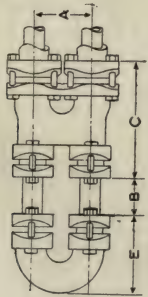
Size of Valve or Fitting.....Inches	7	8	10	12
A—Center to Face of Tongue End Ells, Tees and Crosses.....Inches	9 $\frac{1}{4}$	10 $\frac{1}{4}$	11 $\frac{3}{4}$	13 $\frac{1}{4}$
B—Center to Face of Groove End Ells, Tees and Crosses.....Inches	8 $\frac{13}{16}$	9 $\frac{13}{16}$	11 $\frac{5}{16}$	12 $\frac{13}{16}$
C—Face to Face of Tongue and Groove, Tees and Crosses.....Inches	18 $\frac{1}{16}$	20 $\frac{1}{16}$	23 $\frac{1}{16}$	26 $\frac{1}{16}$
D—Center to Face of Tongue End Globe, Angle and Cross Valves.....Inches	9	10 $\frac{1}{4}$	11 $\frac{1}{2}$	13
E—Center to Face of Groove End Globe, Angle and Cross Valves.....Inches	8 $\frac{9}{16}$	9 $\frac{13}{16}$	11 $\frac{1}{16}$	12 $\frac{9}{16}$
F—Face to Face of Tongue and Groove Globe and Cross Valves.....Inches	17 $\frac{9}{16}$	20 $\frac{1}{16}$	22 $\frac{9}{16}$	25 $\frac{9}{16}$
G—Center to Top of Valve, Open....Inches	22	24 $\frac{1}{2}$	28 $\frac{3}{4}$	31

**NOTE.**—ON TONGUE AND GROOVE VALVES THE GROOVE END IS ON THE END NEXT TO THE UNDER SIDE OF DISC; AND THE TONGUE END OR ENDS ON THE END OR ENDS NEXT TO THE UPPER SIDE OF DISC.

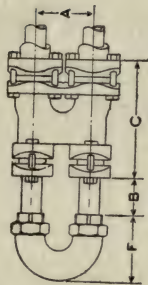
For templates for drilling, see page 731.

# DOUBLE PIPE RETURN BENDS

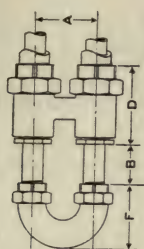
## GENERAL DIMENSIONS



Nos. 1575 AND 1577 WITH FLANGED RETURN BENDS Nos. 1574 AND 1576



Nos. 1575 AND 1577 WITH SCREWED RETURN BENDS Nos. 1574½ AND 1576½



Nos. 1575½ WITH SCREWED RETURN BEND No. 1574½

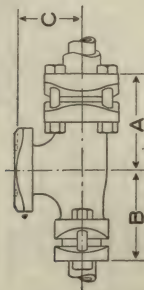
Size	Inches	2 x 1¼	2½ x 1¼	2½ x 2 x 1¼	3 x 2
A—Center to Center	Inches	4⅝	4⅝	4⅝	6
B—Space for Packing	Inches	3	3	3	3
C—Length of Body, Nos. 1575 and 1577	Inches	9⅜	9⅝	9⅝	10½
D—Length of Body, No. 1575½	Inches	6⅜			
E—Height of Bend, Nos. 1574 and 1576	Inches	6	6	6	7½
F—Height of Bend, Nos. 1574½ and 1576½	Inches	5¼	5¼	5¼	6¾

These dimensions are subject to a slight variation and change without notice.

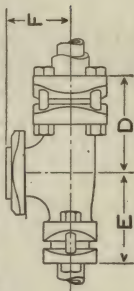
# SPECIAL REDUCING TEES

## FOR DOUBLE PIPE CONDENSERS AND BRINE COOLERS

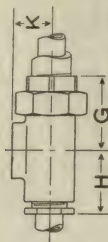
### GENERAL DIMENSIONS



Nos. 1579 AND 1581  
INLET TEES



Nos. 1579½ AND 1581½  
OUTLET TEES



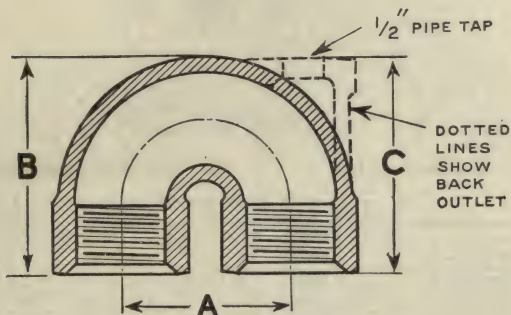
No. 1575¾  
WATER COOLER TEE

Size.	Nos. 1579 and 1581 INLET TEES.			Nos. 1579½ AND 1581½ OUTLET TEES.			No. 1575¾. WATER COOLER TEES.			
	A Inches.	B Inches.	C Inches.	D Inches.	E Inches.	F Inches.	G Inches.	H Inches.	K Inches.	
2 x 1¼ x ¾.....						3 11/16				
2 x 1¼ x 1½.....	5¾	5⅝	3 7/16	5¾	5⅝	3 11/16				
2 x 1¼ x ¾.....				5¾	5⅝	3 11/16				
2 x 1¼ x 1.....	5¾	5⅝	3 7/8	5¾	5⅝	3 11/16				
2 x 1¼ x 1¼.....	5¾	5⅝	3 11/16	5¾	5⅝	3 11/16				
2 x 1¼ x 1½.....	5¾	5⅝	3 11/16	5¾	5⅝	4 1/16				
2 x 1¼ x 2.....	5¾	5⅝	3 11/16	5¾	5⅝					
2½ x 1¼ x 2.....	6⅜	5⅝	3 11/16	5¾	5⅝	3 11/16	4½	3⅝	2¼	
3 x 2 x 1½.....										
3 x 2 x ¾.....	6⅜	5¼	4 7/8							
3 x 2 x 1.....	6	5 7/8	4 3/8							
3 x 2 x 1¼.....										
3 x 2 x 1½.....				6⅝	5¼	5				
3 x 2 x 1.....				6⅝	5¼	5				
3 x 2 x 2.....	6⅝	5¼	4 3/8	6⅝	5¼	5				



# DIMENSIONS OF AMMONIA RETURN BENDS

SCREW ENDS WITH SOLDERING RECESS



No. 1562  
PLAIN

No. 1564  
WITH BACK OUTLET

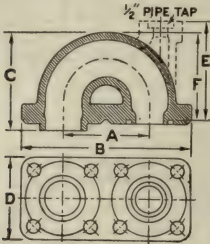
Size.....Inches	1	1	1	1¼	1¼	1¼
Dimension A.....Inches	1¾	2½	3	2¼	2½	3
Dimension B.....Inches	2⅞	3¼	3½	3⅞	3⅞	3⅞

Size.....Inches	1¼	1¼	1¼	1½	1½	1½
Dimension A.....Inches	3½	4	6	3	6	8
Dimension B.....Inches	4⅜	4⅞	5	4⅜	5⅞	6⅞
Dimension C.....Inches			5			

Size.....Inches	2	2	2	2	2	2
Dimension A.....Inches	3	3½	4	4⅝	6	8
Dimension B.....Inches	4⅝	4⅞	5⅞	5⅞	6⅞	7⅞
Dimension C.....Inches		4⅞	5			

AMMONIA RETURN BENDS

GENERAL DIMENSIONS



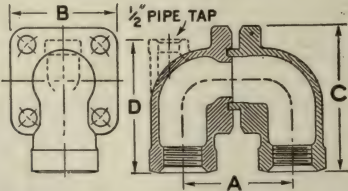
No. 1559 PLAIN

No. 1561 WITH BACK OUTLET

TONGUE AND GROOVE ENDS

Size.....Inches	1¼	1¼	*2	2	2	2	2
Dimension A.....Inches	4	6	4⅝	6	8	10	12
Dimension B.....Inches	7⅛	9⅛	9⅛	11⅛	13⅛	15⅛	17⅛
Dimension C.....Inches	4⅝	5⅝	6½	6⅝	7⅝	8⅝	9⅞
Dimension D.....Inches	3⅛	3⅛	4½	5⅛	5⅛	5⅛	5⅛
Dimension E.....Inches	4⅝	5⅜	6⅝	6⅝			
Dimension F.....Inches	4⅛	5⅛	6	5⅜	6⅜	7⅜	8⅜

\*On this return bend it is necessary to use special square flanges. Standard flanges are used on all other sizes.



No. 1570 PLAIN

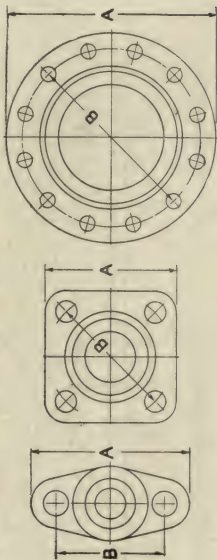
No. 1572 WITH BACK OUTLET

DIVIDED

SCREW ENDS WITH SOLDERING RECESS

Size.....Inches	1¼	1¼	2	2	2	2
Dimension A.....Inches	4	6	3½	4	4⅝	6
Dimension B.....Inches	3⅛	3⅛	5⅛	5⅛	5⅛	5⅛
Dimension C.....Inches	5⅝	5⅝	7⅛	7⅛	7⅛	7⅛
Dimension D.....Inches		4¾	6⅝	6⅝	6⅝	

# DIMENSIONS OF AMMONIA GLANDS, FLANGES AND TEMPLATES FOR DRILLING

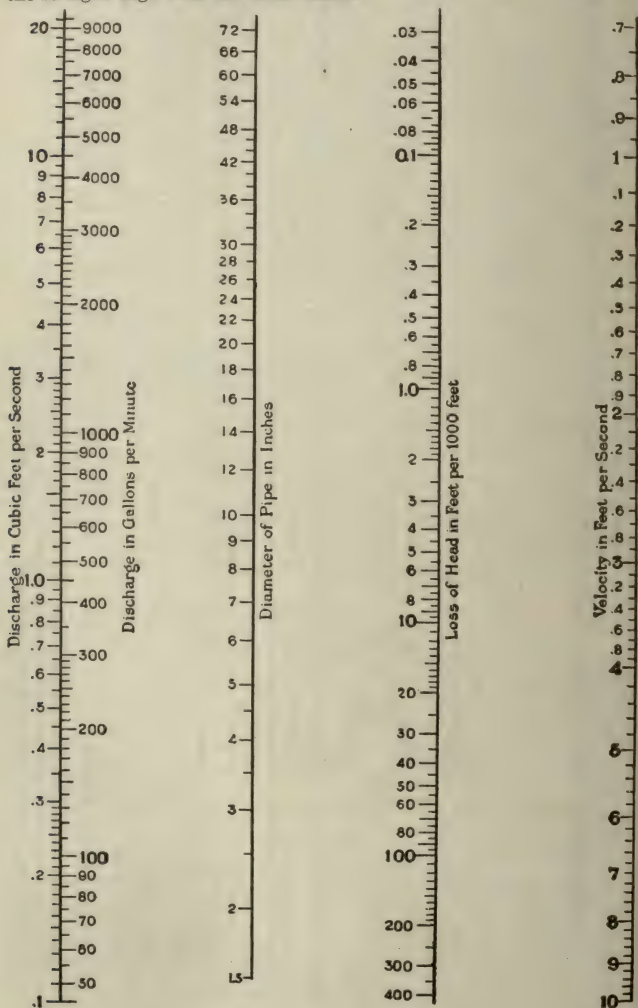


Style of Flange.....	Oval			Square			Round											
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	10	12
Size..... Inches																		
A—Diameter of Flange..... Inches	3 5/8	3 13/16	4	4 3/4	3 9/16	3 15/16	4 1/16	5 1/16	5 15/16	8 1/4	9	10	11	12 1/2	14	15	17 1/2	20 1/2
B—Diameter of Bolt Circle..... Inches	2 3/8	2 9/16	2 3/4	3 1/4	3 1/4	3 3/4	4 1/2	5	5 7/8	6 5/8	7 1/4	7 7/8	9 1/4	10 5/8	11 7/8	13	15 1/4	17 3/4
Number of Bolts.....	2	2	2	2	4	4	4	4	4	8	8	8	8	12	12	12	16	16
Diameter of Bolts..... Inches	1 1/2	1 1/2	1 1/2	5/8	1 1/2	1 1/2	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	1	1 1/8
Length of Bolts for Boyle Joints..... Inches	2 3/4	2 3/4	2 3/4	3 1/4	2 3/4	3	3 1/4	3 1/2	4 1/4	4 1/4	4 1/2	4 3/4	5 1/4	5 1/4				
Length of Bolts for Tongue and Groove Joints, Inches	2 3/4	2 3/4	2 3/4	3 1/4	2 1/2	2 3/4	3	3	3 3/4	3 3/4	4	4 1/4	4 1/2	4 1/2	4	4 1/4	5	5 1/4

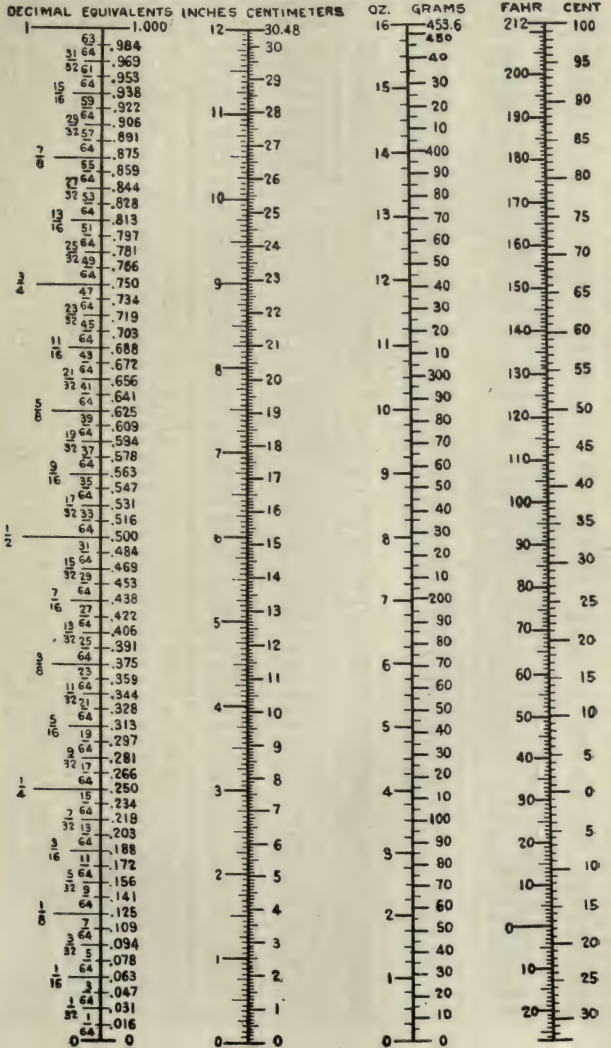
The Bolt Holes are 1/8 inch larger than diameter of bolts.

# DIAGRAM FOR CALCULATING PIPE SIZES, DISCHARGE VELOCITIES, AND LOSS OF HEAD IN WATER PIPE

Lay a straight edge on scales at the points for any two known quantities and the unknown quantities will lie at the intersection of the straight edge with the other scales.



DECIMAL EQUIVALENTS OF PARTS OF AN INCH AND CONVERSION  
CHART FOR METRIC LENGTHS, WEIGHTS AND TEMPERATURES  
COURTESY OF THE NATIONAL TUBE COMPANY





## CIRCUMFERENCES AND AREAS OF CIRCLES

Diam.	Circum.	Area.	Diam.	Circum.	Area.	Diam.	Circum.	Area.
$\frac{1}{16}$	.04909	.00019	$2\frac{11}{16}$	8.4430	5.6727	7	21.991	38.485
$\frac{3}{32}$	.09818	.00077	$\frac{3}{4}$	8.6394	5.9396	$\frac{1}{8}$	22.384	39.871
$\frac{1}{4}$	.14726	.00173	$\frac{13}{16}$	8.8357	6.2126	$\frac{1}{4}$	22.776	41.282
$\frac{5}{16}$	.19635	.00307	$\frac{1}{2}$	9.0321	6.4918	$\frac{3}{8}$	23.169	42.718
$\frac{3}{8}$	.29452	.00690	$\frac{5}{8}$	9.2284	6.7771	$\frac{1}{2}$	23.562	44.179
$\frac{1}{2}$	.39270	.01227	3	9.4248	7.0686	$\frac{5}{8}$	23.955	45.664
$\frac{5}{8}$	.49087	.01917	$\frac{1}{16}$	9.6211	7.3662	$\frac{3}{4}$	24.347	47.173
$\frac{3}{4}$	.58905	.02761	$\frac{1}{8}$	9.8175	7.6699	$\frac{7}{8}$	24.740	48.707
$\frac{7}{8}$	.68722	.03758	$\frac{9}{16}$	10.014	7.9798	8	25.133	50.265
$1\frac{1}{4}$	.78540	.04909	$\frac{1}{4}$	10.210	8.2958	$\frac{1}{8}$	25.525	51.849
$\frac{9}{8}$	.88357	.06213	$\frac{5}{16}$	10.407	8.6179	$\frac{1}{4}$	25.918	53.456
$\frac{5}{16}$	.98175	.07670	$\frac{3}{8}$	10.603	8.9462	$\frac{3}{8}$	26.311	55.088
1	1.0799	.09281	$\frac{1}{2}$	10.799	9.2806	$\frac{1}{2}$	26.704	56.745
$\frac{1}{8}$	1.1781	.11045	$\frac{1}{2}$	10.996	9.6211	$\frac{5}{8}$	27.096	58.426
$\frac{1}{8}$	1.2763	.12962	$\frac{5}{8}$	11.192	9.9678	$\frac{3}{4}$	27.489	60.132
$\frac{1}{8}$	1.3744	.15033	$\frac{3}{4}$	11.388	10.321	$\frac{7}{8}$	27.882	61.862
$\frac{1}{8}$	1.4726	.17257	$\frac{11}{16}$	11.585	10.680	9	28.274	63.617
$1\frac{1}{2}$	1.5708	.19635	$\frac{3}{4}$	11.781	11.045	$\frac{1}{8}$	28.667	65.397
$\frac{1}{8}$	1.6690	.22166	$\frac{1}{2}$	11.977	11.416	$\frac{1}{4}$	29.060	67.201
$\frac{9}{16}$	1.7671	.24850	$\frac{5}{8}$	12.174	11.793	$\frac{3}{8}$	29.452	69.029
$\frac{1}{2}$	1.8653	.27688	$\frac{11}{16}$	12.370	12.177	$\frac{1}{2}$	29.845	70.882
$\frac{5}{8}$	1.9635	.30680	4	12.566	12.566	$\frac{5}{8}$	30.238	72.760
$\frac{3}{4}$	2.0617	.33824	$\frac{1}{16}$	12.763	12.962	$\frac{3}{4}$	30.631	74.662
$\frac{1}{2}$	2.1598	.37122	$\frac{1}{8}$	12.959	13.364	$\frac{7}{8}$	31.023	76.589
$\frac{1}{2}$	2.2580	.40574	$\frac{9}{16}$	13.155	13.772	10	31.416	78.540
$\frac{3}{4}$	2.3562	.44179	$\frac{1}{4}$	13.352	14.186	$\frac{1}{4}$	32.201	82.516
$\frac{1}{2}$	2.4544	.47937	$\frac{5}{16}$	13.548	14.607	$\frac{1}{2}$	32.987	86.590
$\frac{1}{2}$	2.5525	.51849	$\frac{3}{8}$	13.744	15.033	$\frac{3}{4}$	33.772	90.763
$\frac{1}{2}$	2.6507	.55914	$\frac{1}{2}$	13.941	15.466	11	34.558	95.033
$\frac{1}{2}$	2.7489	.60132	$\frac{1}{2}$	14.137	15.904	$\frac{1}{4}$	35.343	99.402
$\frac{1}{2}$	2.8471	.64504	$\frac{5}{8}$	14.334	16.349	$\frac{1}{2}$	36.128	103.87
$\frac{1}{2}$	2.9452	.69029	$\frac{11}{16}$	14.530	16.800	$\frac{3}{4}$	36.914	108.43
$\frac{1}{2}$	3.0434	.73708	$\frac{3}{4}$	14.726	17.257	12	37.699	113.10
1	3.1416	.7854	$\frac{11}{16}$	14.923	17.721	$\frac{1}{4}$	38.485	117.86
$\frac{1}{16}$	3.3379	.8866	$\frac{1}{2}$	15.119	18.190	$\frac{1}{2}$	39.270	122.72
$\frac{1}{8}$	3.5343	.9940	$\frac{1}{8}$	15.315	18.665	$\frac{3}{4}$	40.055	127.68
$\frac{1}{4}$	3.7306	1.1075	5	15.512	19.147	13	40.841	132.73
$\frac{1}{4}$	3.9270	1.2272	$\frac{1}{16}$	15.708	19.635	$\frac{1}{4}$	41.626	137.89
$\frac{1}{4}$	4.1233	1.3530	$\frac{1}{8}$	15.904	20.129	$\frac{1}{2}$	42.412	143.14
$\frac{1}{4}$	4.3197	1.4849	$\frac{3}{16}$	16.101	20.629	$\frac{3}{4}$	43.197	148.49
$\frac{1}{4}$	4.5160	1.6230	$\frac{1}{4}$	16.297	21.135	14	43.982	153.94
$\frac{1}{4}$	4.7124	1.7671	$\frac{1}{4}$	16.493	21.648	$\frac{1}{4}$	44.768	159.48
$\frac{1}{4}$	4.9087	1.9175	$\frac{5}{16}$	16.690	22.166	$\frac{1}{2}$	45.553	165.13
$\frac{1}{4}$	5.1051	2.0739	$\frac{3}{8}$	16.886	22.691	$\frac{3}{4}$	46.338	170.87
$\frac{1}{4}$	5.3014	2.2365	$\frac{1}{2}$	17.082	23.221	15	47.124	176.71
$\frac{1}{4}$	5.4978	2.4053	$\frac{1}{2}$	17.279	23.758	$\frac{1}{4}$	47.909	182.65
$\frac{1}{4}$	5.6941	2.5802	$\frac{5}{8}$	17.475	24.301	$\frac{1}{2}$	48.695	188.69
$\frac{1}{4}$	5.8905	2.7612	$\frac{3}{4}$	17.671	24.850	$\frac{3}{4}$	49.480	194.83
$\frac{1}{4}$	6.0868	2.9483	$\frac{11}{16}$	17.868	25.406	16	50.265	201.06
2	6.2832	3.1416	$\frac{3}{4}$	18.064	25.967	$\frac{1}{4}$	51.051	207.39
$\frac{1}{16}$	6.4795	3.3410	$\frac{1}{2}$	18.261	26.535	$\frac{1}{2}$	51.836	213.82
$\frac{1}{16}$	6.6759	3.5466	$\frac{1}{8}$	18.457	27.109	$\frac{3}{4}$	52.622	220.35
$\frac{1}{16}$	6.8722	3.7583	6	18.653	27.688	17	53.407	226.98
$\frac{1}{16}$	7.0686	3.9761	$\frac{1}{8}$	18.850	28.274	$\frac{1}{4}$	54.192	233.71
$\frac{1}{16}$	7.2649	4.2000	$\frac{1}{4}$	19.046	28.865	$\frac{1}{2}$	54.978	240.53
$\frac{1}{16}$	7.4613	4.4301	$\frac{3}{8}$	19.242	29.465	$\frac{3}{4}$	55.763	247.45
$\frac{1}{16}$	7.6576	4.6664	$\frac{1}{2}$	19.438	30.070	18	56.549	254.47
$\frac{1}{16}$	7.8540	4.9087	$\frac{5}{8}$	19.635	30.680	$\frac{1}{4}$	57.334	261.59
$\frac{1}{16}$	8.0503	5.1572	$\frac{3}{4}$	19.831	31.293	$\frac{1}{2}$	58.119	268.80
$\frac{1}{16}$	8.2467	5.4119	$\frac{7}{8}$	20.028	31.919	$\frac{3}{4}$	58.905	276.12
				20.224	32.550			
				20.420	33.183			
				20.616	33.820			
				20.813	34.462			
				21.010	35.109			
				21.206	35.762			
				21.403	36.420			
				21.598	37.082			

## CIRCUMFERENCES AND AREAS OF CIRCLES—CONTINUED

Diam.	Circum.	Area.	Diam.	Circum.	Area.	Diam.	Circum.	Area.
19	59.690	283.53	34 $\frac{1}{2}$	108.385	934.82	50	157.080	1963.5
$\frac{1}{4}$	60.476	291.04	$\frac{3}{4}$	109.190	948.42	51	160.221	2042.8
$\frac{1}{2}$	61.261	298.65	35	109.956	962.11	52	163.363	2123.7
$\frac{3}{4}$	62.046	306.35	$\frac{1}{4}$	110.741	975.91	53	166.504	2206.2
20	62.832	314.16	$\frac{1}{2}$	111.527	989.80	54	169.646	2290.2
$\frac{1}{4}$	63.617	322.06	$\frac{3}{4}$	112.312	1003.8	55	172.788	2375.8
$\frac{1}{2}$	64.403	330.06	36	113.097	1017.9	56	175.929	2463.0
$\frac{3}{4}$	65.188	338.16	$\frac{1}{4}$	113.883	1032.1	57	179.071	2551.8
21	65.973	346.36	$\frac{1}{2}$	114.668	1046.3	58	182.212	2642.1
$\frac{1}{4}$	66.759	354.66	$\frac{3}{4}$	115.454	1060.7	59	185.354	2734.0
$\frac{1}{2}$	67.544	363.05	37	116.239	1075.2	60	188.496	2827.4
$\frac{3}{4}$	68.330	371.54	$\frac{1}{4}$	117.024	1089.8	61	191.637	2922.5
22	69.115	380.13	$\frac{1}{2}$	117.810	1104.5	62	194.779	3019.1
$\frac{1}{4}$	69.900	388.82	$\frac{3}{4}$	118.596	1119.2	63	197.920	3117.2
$\frac{1}{2}$	70.686	397.61	38	119.381	1134.1	64	201.062	3217.0
$\frac{3}{4}$	71.471	406.49	$\frac{1}{4}$	120.166	1149.1	65	204.204	3318.3
23	72.257	415.48	$\frac{1}{2}$	120.951	1164.2	66	207.345	3421.2
$\frac{1}{4}$	73.042	424.56	$\frac{3}{4}$	121.737	1179.3	67	210.487	3525.7
$\frac{1}{2}$	73.827	433.74	39	122.522	1194.6	68	213.628	3631.7
$\frac{3}{4}$	74.613	443.01	$\frac{1}{4}$	123.308	1210.0	69	216.770	3739.3
24	75.398	452.39	$\frac{1}{2}$	124.093	1225.4	70	219.911	3848.5
$\frac{1}{4}$	76.184	461.86	$\frac{3}{4}$	124.878	1241.0	71	223.053	3959.2
$\frac{1}{2}$	76.969	471.44	40	125.664	1256.6	72	226.195	4071.5
$\frac{3}{4}$	77.754	481.11	$\frac{1}{4}$	126.449	1272.4	73	229.336	4185.4
25	78.540	490.87	$\frac{1}{2}$	127.235	1288.2	74	232.478	4300.8
$\frac{1}{4}$	79.325	500.74	$\frac{3}{4}$	128.020	1304.2	75	235.619	4417.9
$\frac{1}{2}$	80.111	510.71	41	128.805	1320.3	76	238.761	4536.5
$\frac{3}{4}$	80.896	520.77	$\frac{1}{4}$	129.591	1336.4	77	241.903	4656.6
26	81.681	530.93	$\frac{1}{2}$	130.376	1352.7	78	245.044	4778.4
$\frac{1}{4}$	82.467	541.19	$\frac{3}{4}$	131.161	1369.0	79	248.186	4901.7
$\frac{1}{2}$	83.252	551.55	42	131.947	1385.4	80	251.327	5026.5
$\frac{3}{4}$	84.038	562.00	$\frac{1}{4}$	132.732	1402.0	81	254.469	5153.0
27	84.823	572.56	$\frac{1}{2}$	133.518	1418.6	82	257.611	5281.0
$\frac{1}{4}$	85.608	583.21	$\frac{3}{4}$	134.303	1435.4	83	260.752	5410.6
$\frac{1}{2}$	86.394	593.96	43	135.088	1452.2	84	263.894	5541.8
$\frac{3}{4}$	87.179	604.81	$\frac{1}{4}$	135.874	1469.1	85	267.035	5674.5
28	87.965	615.75	$\frac{1}{2}$	136.659	1486.2	86	270.177	5808.8
$\frac{1}{4}$	88.750	626.80	$\frac{3}{4}$	137.445	1503.3	87	273.319	5944.7
$\frac{1}{2}$	89.535	637.94	44	138.230	1520.5	88	276.460	6082.1
$\frac{3}{4}$	90.321	649.18	$\frac{1}{4}$	139.015	1537.9	89	279.602	6221.1
29	91.106	660.52	$\frac{1}{2}$	139.801	1555.3	90	282.743	6361.7
$\frac{1}{4}$	91.892	671.96	$\frac{3}{4}$	140.586	1572.8	91	285.885	6503.9
$\frac{1}{2}$	92.677	683.49	45	141.372	1590.4	92	289.027	6647.6
$\frac{3}{4}$	93.462	695.13	$\frac{1}{4}$	142.157	1608.2	93	292.168	6792.9
30	94.248	706.86	$\frac{1}{2}$	142.942	1626.0	94	295.310	6939.8
$\frac{1}{4}$	95.033	718.69	$\frac{3}{4}$	143.728	1643.9	95	298.451	7088.2
$\frac{1}{2}$	95.819	730.62	46	144.513	1661.9	96	301.593	7238.2
$\frac{3}{4}$	96.604	742.64	$\frac{1}{4}$	145.299	1680.0	97	304.734	7389.8
31	97.389	754.77	$\frac{1}{2}$	146.084	1698.2	98	307.876	7543.0
$\frac{1}{4}$	98.175	766.99	$\frac{3}{4}$	146.869	1716.5	99	311.018	7697.7
$\frac{1}{2}$	98.960	779.31	47	147.655	1734.9	100	314.159	7854.0
$\frac{3}{4}$	99.746	791.73	$\frac{1}{4}$	148.440	1753.5	101	317.30	8011.85
32	100.531	804.25	$\frac{1}{2}$	149.226	1772.1	102	320.44	8171.28
$\frac{1}{4}$	101.316	816.86	$\frac{3}{4}$	150.011	1790.8	103	323.58	8332.29
$\frac{1}{2}$	102.102	829.58	48	150.796	1809.6	104	326.73	8494.87
$\frac{3}{4}$	102.887	842.39	$\frac{1}{4}$	151.582	1828.5	105	329.87	8659.01
33	103.673	855.30	$\frac{1}{2}$	152.367	1847.5	106	333.01	8824.73
$\frac{1}{4}$	104.458	868.31	$\frac{3}{4}$	153.153	1866.5	107	336.15	8992.02
$\frac{1}{2}$	105.243	881.41	49	153.938	1885.7	108	339.29	9160.88
$\frac{3}{4}$	106.029	894.62	$\frac{1}{4}$	154.723	1905.0	109	342.43	9331.32
34	106.814	907.92	$\frac{1}{2}$	155.509	1924.4	110	345.58	9503.32
$\frac{1}{4}$	107.600	921.32	$\frac{3}{4}$	156.294	1943.9			

### THE CIRCLE

The circumference of a circle is equal to the diameter multiplied by 3.1416.

The area of a circle is equal to the square of the diameter multiplied by .7854.

TO FIND THE LENGTH OF AN ARC OF A CIRCLE.—Multiply the diameter of the circle by the number of degrees in the arc and this product by .0087266.

TO FIND THE AREA OF A SECTOR OF A CIRCLE.—Multiply the number of degrees in the arc of the sector by the square of the radius and by .008727; or, multiply the arc of the sector by half its radius.

### THE TRIANGLE

VARIETIES.—Right angled, having one right angle; obtuse angled, having one obtuse angle; isosceles, having two equal angles and two equal sides; equilateral, having three equal sides and equal angles.

The sum of the three angles of any triangle equals 180 degrees.

The two acute angles of a right angled triangle are complements of each other.

Hypotenuse of a right angled triangle, the side opposite the right angle, equals  $\sqrt{\text{sum of the squares of the other two sides}}$ .

TO FIND THE AREA OF A TRIANGLE.—Multiply the base by half the height.

THE AREA OF A TRIANGLE BEING GIVEN TO FIND THE LENGTH OF THE BASE.—Base equals twice the area divided by perpendicular height.

AREA OF A TRIANGLE BEING GIVEN TO FIND THE HEIGHT.—Height equals twice area divided by base.

### QUADRILATERAL FIGURE

TO FIND THE AREA.—Divide the figure into two triangles; the sum of the areas of the triangles is the area.

### THE ELLIPSE

TO FIND THE AREA.—Multiply the two diameters together and the product by .7854.

### THE SPHERE

TO COMPUTE THE SURFACE.—Multiply the diameter by the circumference and the product will give the surface.

TO COMPUTE THE TOTAL VOLUME.—Multiply the cube of the diameter by .5236.

### THE CYLINDER

TO COMPUTE THE SURFACE.—Multiply the length by the circumference and add the product to the area of the two ends.

## BOILER HORSE POWER

The accepted rule for figuring boiler horse power is as follows:

One Horse Power equals the evaporation of 30 lbs. of water per hour from an initial temperature of 100 deg. Fahr. into steam at 70 lbs. gauge pressure, or its equivalent; 34½ lbs. of water evaporated per hour from a temperature of 212 deg. Fahr. into steam at 212 deg.

## HORSE POWER OF AN ENGINE

P equals mean effective pressure per square inch of the steam on the piston.

L " length of stroke in feet.

A " area of piston in square inches.

N " number of strokes per minute.

Then Horse Power equals  $\frac{PLAN}{33000}$

33000

The approximate mean effective pressure in the cylinder when valve cuts off at:

$\frac{1}{4}$ stroke equals steam pressure	×	.597
$\frac{1}{2}$ " " " "	×	.670
$\frac{3}{8}$ " " " "	×	.743
$\frac{1}{2}$ " " " "	×	.847
$\frac{5}{8}$ " " " "	×	.919
$\frac{3}{4}$ " " " "	×	.937
$\frac{7}{8}$ " " " "	×	.966
$\frac{7}{8}$ " " " "	×	.992

## RANGES IN STEAM CONSUMPTION BY PRIME MOVERS (FOR ESTIMATING PURPOSES)

Simple Non-Condensing Engines.....	29-45 pounds per hour.
" " " Automatic Engines	26-40 " " "
" " " Corliss Engines....	26-35 " " "
Compound Non-Condensing Engines.....	19-28 " " "
" Condensing Engines.....	12-22 " " "
Simple Duplex Steam Pumps.....	120-200 " " "
Turbines, Non-Condensing.....	28-60 " " K. W. hour.
" Condensing.....	12-42 " " K. W. hour.

## FLOW OF STEAM IN PIPES

To determine the velocity of steam in feet per minute through a pipe, the quantity, pressure and area being known.

V equals velocity in feet per minute.

A " pounds of steam per hour.

B " volume in cubic feet of 1 lb. at given pressure. (See steam tables, pages 738 and 739.)

C " area of pipe in square inches.

1728 " cubic inches in a cubic foot.

60 " minutes in an hour.

12 " inches in a foot.

Then V equals  $\frac{A \times B \times 1728}{60 \times C \times 12}$  equals  $\frac{A \times B \times 2.4}{C}$

Or A equals  $\frac{C \times V}{B \times 2.4}$

Or B equals  $\frac{C \times V}{A \times 2.4}$

Or C equals  $\frac{A \times B \times 2.4}{V}$

## LOSS OF PRESSURE

The above formula does not consider the probable drop, or loss of pressure which is dependent upon the velocity of flow, length of line, number of turns in fittings or valves, and the covering of the pipe. In every steam line there must be a difference in pressure between the inlet and outlet or there could be no flow, and this difference is increased by friction and radiation.

In power plant work a steam velocity of 4,000 to 6,000 feet per minute may be employed without excessive loss, in properly covered pipes 6 inches diameter or larger. For smaller pipe use a lower velocity.



# PROPERTIES OF SATURATED STEAM

CONDENSED FROM STEAM TABLES AND DIAGRAMS

BY MARKS & DAVIS, WITH THE PERMISSION OF THE

PUBLISHERS, MESSRS. LONGMANS, GREEN & CO.

Vacuum, Inches of Mercury	Tempera- ture, Fahr.	TOTAL HEAT ABOVE 32° FAHR.		Latent Heat Heat Units	Volume, Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pound
		Heat Units in the Water	Heat Units in the Steam			
29.74	32.00	0.00	1073.4	1073.4	3294.0	0.000304
29.18	70.00	38.06	1090.3	1052.3	871.0	0.001148
25.85	126.15	94.0	1115.0	1021.0	173.5	0.00576
15.67	176.85	144.7	1136.5	991.8	53.56	0.01867
9.56	193.22	161.1	1143.1	982.0	38.38	0.02606
5.49	201.96	169.9	1146.5	976.6	32.36	0.03090
Lbs. Gauge						
0	212.0	180.0	1150.4	970.4	26.79	0.03732
0.3	213.0	181.0	1150.7	969.7	26.27	0.03806
1.3	216.3	184.4	1152.0	967.6	24.79	0.04042
2.3	219.4	187.5	1153.1	965.6	23.38	0.04277
3.3	222.4	190.5	1154.2	963.7	22.16	0.04512
4.3	225.2	193.4	1155.2	961.8	21.07	0.04746
5.3	228.0	196.1	1156.2	960.0	20.08	0.04980
10.3	240.1	208.4	1160.4	952.0	16.30	0.0614
15.3	250.3	218.8	1163.9	945.1	13.74	0.0728
20.3	259.3	227.9	1166.8	938.9	11.89	0.0841
25.3	267.3	236.1	1169.4	933.3	10.49	0.0953
30.3	274.5	243.4	1171.6	928.2	9.39	0.1065
35.3	281.0	250.1	1173.6	923.5	8.54	0.1175
40.3	287.1	256.3	1175.4	919.0	7.78	0.1285
45.3	292.7	262.1	1177.0	914.9	7.17	0.1394
50.3	298.0	267.5	1178.5	911.0	6.65	0.1503
55.3	302.9	272.6	1179.8	907.2	6.20	0.1612
60.3	307.6	277.4	1181.1	903.7	5.81	0.1721
65.3	312.0	282.0	1182.3	900.3	5.47	0.1829
70.3	316.3	286.3	1183.4	897.1	5.16	0.1937
75.3	320.3	290.5	1184.4	893.9	4.89	0.2044

(CONTINUED)



# PROPERTIES OF SATURATED STEAM

CONDENSED FROM STEAM TABLES AND DIAGRAMS

BY MARKS & DAVIS, WITH THE PERMISSION OF THE

PUBLISHERS, MESSRS. LONGMANS, GREEN & CO.

Gauge Pressure, Pounds, per Square Inch	Tempera- ture, Fahr.	TOTAL HEAT ABOVE 32° FAHR.		Latent Heat Heat Units	Volume, Cubic Feet in One Pound of Steam	Weight of One Cubic Foot Steam, Pound
		Heat Units in the Water	Heat Units in the Steam			
80.3	324.1	294.5	1185.4	890.9	4.65	0.2151
85.3	327.8	298.3	1186.3	888.0	4.429	0.2258
90.3	331.4	302.0	1187.2	885.2	4.230	0.2365
95.3	334.8	305.5	1188.0	882.5	4.047	0.2472
100.3	338.1	309.0	1189.8	879.8	3.880	0.2577
105.3	341.3	312.3	1189.6	877.2	3.726	0.2683
110.3	344.4	315.5	1190.3	874.7	3.583	0.2791
115.3	347.4	318.6	1191.0	872.3	3.452	0.2897
120.3	350.3	321.7	1191.6	869.9	3.331	0.3002
125.3	353.1	324.6	1192.2	867.6	3.219	0.3107
130.3	355.8	327.4	1192.8	865.4	3.112	0.3213
135.3	358.5	330.2	1193.4	863.2	3.012	0.3320
140.3	361.0	332.9	1194.0	861.0	2.920	0.3425
145.3	363.6	335.6	1194.5	858.8	2.834	0.3529
150.3	366.0	338.2	1195.0	856.8	2.753	0.3633
155.3	368.5	340.7	1195.4	854.7	2.675	0.3738
160.3	370.8	343.2	1195.9	852.7	2.602	0.3843
165.3	373.1	345.6	1196.4	850.8	2.533	0.3948
170.3	375.4	348.0	1196.8	848.8	2.468	0.4052
175.3	377.6	350.4	1197.3	846.9	2.406	0.4157
180.3	379.8	352.7	1197.7	845.0	2.346	0.4262
185.3	381.9	354.9	1198.1	843.2	2.290	0.437
190.3	384.0	357.1	1198.5	841.4	2.237	0.447
195.3	386.0	359.2	1198.8	839.6	2.187	0.457
200.3	388.0	361.4	1199.2	837.9	2.138	0.468
225.3	397.4	371.4	1200.9	829.5	1.924	0.520
250.3	406.2	380.7	1202.3	821.6	1.750	0.571
275.3	414.4	389.4	1203.6	814.2	1.602	0.624
300.3	421.9	397.5	1204.7	807.2	1.479	0.676

# PROPERTIES OF AMMONIA

FROM MARKS' MECHANICAL ENGINEERS' HANDBOOK

Temperature, deg. Fahr.	Pressure, lb. per square inch, abs.	SPECIFIC VOLUME		HEAT CONTENT		Heat of vapor- ization	Internal energy of vapor- ization	ENTROPY	
		Of liquid, cubic feet per pound	Of sat. vapor, cubic feet per pound	Of liquid	Of sat. vapor			Of liquid	Of vapor- ization
-40	10.12	0.0234	25.45	-75.3	526.6	601.9	554.2	-0.1653	1.4343
-35	11.74	0.0235	22.14	-70.2	528.2	598.3	550.2	-0.1531	1.4090
-30	13.56	0.0236	19.35	-65.0	529.8	594.7	546.2	-0.1410	1.3842
-25	15.61	0.0238	16.95	-59.8	531.3	591.1	542.1	-0.1290	1.3598
-20	17.91	0.0239	14.89	-54.6	532.8	587.4	538.0	-0.1171	1.3360
-15	20.46	0.0240	13.15	-49.4	534.3	583.6	533.9	-0.1054	1.3126
-10	23.30	0.0241	11.63	-44.2	535.7	579.9	529.8	-0.0938	1.2896
-5	26.46	0.0242	10.32	-38.9	537.1	576.1	525.6	-0.0824	1.2671
0	29.95	0.0244	9.19	-33.7	538.5	572.2	521.4	-0.0709	1.2449
5	33.79	0.0245	8.20	-28.4	539.9	568.3	517.1	-0.0595	1.2231
10	38.02	0.0246	7.34	-23.2	541.2	564.4	512.9	-0.0483	1.2017
15	42.67	0.0248	6.583	-17.9	542.5	560.4	508.6	-0.0372	1.1806
20	47.75	0.0249	5.920	-12.6	543.7	556.3	504.2	-0.0262	1.1599
25	53.30	0.0250	5.336	-7.3	545.0	552.2	499.8	-0.0153	1.1395
30	59.39	0.0252	4.820	-1.9	546.2	548.1	495.4	-0.0044	1.1194
35	65.91	0.0253	4.364	+3.5	547.4	543.9	491.0	+0.0065	1.0996
40	73.03	0.0255	3.959	8.9	548.5	539.7	486.5	0.0173	1.0801
45	80.75	0.0256	3.599	14.3	549.7	535.3	481.9	0.0280	1.0609
50	89.09	0.0258	3.278	19.8	550.8	531.0	477.3	0.0387	1.0419
55	98.03	0.0259	2.992	25.3	551.9	526.5	472.7	0.0494	1.0231
60	107.7	0.0261	2.734	30.9	552.9	522.0	468.0	0.0601	1.0046
65	118.1	0.0263	2.503	36.5	554.0	517.5	463.3	0.0708	0.9863
70	129.2	0.0264	2.296	42.1	555.0	512.8	458.5	0.0813	0.9683
75	141.1	0.0266	2.109	47.8	556.0	508.1	453.7	0.0919	0.9504
80	153.9	0.0268	1.940	53.6	557.0	503.4	448.8	0.1025	0.9328
85	167.4	0.0270	1.788	59.4	557.9	498.5	443.9	0.1132	0.9153
90	181.8	0.0271	1.650	65.3	558.9	493.5	438.9	0.1238	0.8980
95	197.3	0.0273	1.524	71.3	559.8	488.5	433.9	0.1344	0.8808
100	213.8	0.0275	1.408	77.3	560.7	483.4	428.7	0.1450	0.8638
105	231.2	0.0277	1.305	83.4	561.6	478.2	423.5	0.1557	0.8469
110	249.6	0.0280	1.210	89.6	562.5	472.9	418.3	0.1664	0.8302
115	269.2	0.0282	1.122	95.9	563.3	467.4	412.9	0.1772	0.8135
120	289.9	0.0284	1.042	102.2	564.2	461.9	407.5	0.1881	0.7969
125	311.6	0.0286	0.970	108.7	565.0	456.3	402.0	0.1990	0.7805

## STRENGTH OF BOLTS

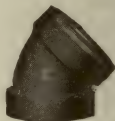
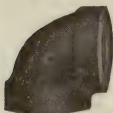
Diam- eter of Bolts  Inches	Number of Threads per Inch	AREAS		TENSILE STRESS			SHEARING STRESS			
		Full Bolt  Sq. Inches	Bottom of of Threads  Sq. Inches	10,000 Lbs. per Sq. Inch	12,500 Lbs. per Sq. Inch	17,500 Lbs. per Sq. Inch	Full Bolt		Bottom of Thread	
				Pounds	Pounds	Pounds	Pounds	7,500 Lbs. per Sq. Inch Pounds	10,000 Lbs. per Sq. Inch Pounds	7,500 Lbs. per Sq. Inch Pounds
1/4	20	.049	.027	270	340	470	380	490	200	270
5/16	18	.077	.045	450	570	790	580	770	340	450
3/8	16	.110	.068	680	850	1,190	830	1,100	510	680
7/16	14	.150	.093	930	1,170	1,630	1,130	1,500	700	930
1/2	12	.196	.120	1,200	1,500	2,100	1,470	1,960	900	1,200
9/16	12	.248	.162	1,620	2,030	2,840	1,860	2,480	1,220	1,620
5/8	11	.307	.202	2,020	2,520	3,530	2,300	3,070	1,510	2,020
3/4	10	.442	.302	3,020	3,770	5,290	3,310	4,420	2,270	3,020
7/8	9	.601	.419	4,190	5,240	7,340	4,510	6,010	3,150	4,190
1	8	.785	.551	5,510	6,890	9,640	5,890	7,850	4,130	5,510
1 1/8	7	.994	.693	6,930	8,660	12,130	7,450	9,940	5,200	6,930
1 1/4	7	1.227	.890	8,890	11,120	15,570	9,200	12,270	6,670	8,900
1 3/8	6	1.485	1.054	10,540	13,180	18,450	11,140	14,850	7,910	10,540
1 1/2	6	1.767	1.294	12,940	16,170	22,640	13,250	17,670	9,700	12,940
1 5/8	5 1/2	2.074	1.515	15,150	18,940	26,510	15,550	20,740	11,360	15,150
1 3/4	5	2.405	1.745	17,450	21,800	30,520	18,040	24,050	13,080	17,440
1 7/8	5	2.761	2.049	20,490	25,610	35,860	20,710	27,610	15,370	20,490
2	4 1/2	3.142	2.300	23,000	28,750	40,250	23,560	31,420	17,250	23,000
2 1/4	4 1/2	3.967	3.021	30,210	37,770	52,870	29,820	39,760	22,660	30,210
2 1/2	4	4.909	3.716	37,160	46,450	65,040	36,820	49,090	27,870	37,160

## LIST OF SIZES STANDARD CAST IRON FITTINGS

In arranging the order of Cast Iron Fittings we will use the following rule: For example, it is well known the largest opening, either in the run or branch, determines the size of the fitting. A  $\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{4}$  Tee will, therefore, be found amongst the  $1\frac{1}{4}$  inch fittings. Of course, these remarks apply to all sizes and combinations.

In describing Fittings, the run is first named, then the outlet.

### ELBOWS



Size
* $\frac{1}{4} \times \frac{1}{4}$
* $\frac{3}{8} \times \frac{3}{8}$
$\frac{3}{8} \times \frac{1}{4}$
* $\frac{1}{2} \times \frac{1}{2}$
* $\frac{1}{2} \times \frac{3}{8}$
$\frac{1}{2} \times \frac{1}{4}$
* $\frac{3}{4} \times \frac{3}{4}$
* $\frac{3}{4} \times \frac{1}{2}$
$\frac{3}{4} \times \frac{3}{8}$
* 1 $\times$ 1
* 1 $\times$ $\frac{3}{4}$
1 $\times$ $\frac{1}{2}$
1 $\times$ $\frac{3}{8}$
* $1\frac{1}{4} \times 1\frac{1}{4}$
$1\frac{1}{4} \times 1$
$1\frac{1}{4} \times \frac{3}{4}$
$1\frac{1}{4} \times \frac{1}{2}$
$1\frac{1}{4} \times \frac{3}{8}$
* $1\frac{1}{2} \times 1\frac{1}{2}$
* $1\frac{1}{2} \times 1\frac{1}{4}$
$1\frac{1}{2} \times 1$
$1\frac{1}{2} \times \frac{3}{4}$

Size
* 2 $\times$ 2
* 2 $\times$ $1\frac{1}{2}$
* 2 $\times$ $1\frac{1}{4}$
* 2 $\times$ 1
* 2 $\times$ $\frac{3}{4}$
* $2\frac{1}{2} \times 2\frac{1}{2}$
* $2\frac{1}{2} \times 2$
$2\frac{1}{2} \times 1\frac{1}{2}$
$2\frac{1}{2} \times 1\frac{1}{4}$
$2\frac{1}{2} \times 1$
* 3 $\times$ 3
3 $\times$ $2\frac{1}{2}$
* 3 $\times$ 2
3 $\times$ $1\frac{1}{2}$
3 $\times$ $1\frac{1}{4}$
* $3\frac{1}{2} \times 3\frac{1}{2}$
$3\frac{1}{2} \times 3$
$3\frac{1}{2} \times 2\frac{1}{2}$
$3\frac{1}{2} \times 2$
* 4 $\times$ 4
4 $\times$ $3\frac{1}{2}$
* 4 $\times$ 3

Size
4 $\times$ $2\frac{1}{2}$
4 $\times$ 2
* $4\frac{1}{2} \times 4\frac{1}{2}$
$4\frac{1}{2} \times 4$
* 5 $\times$ 5
5 $\times$ $4\frac{1}{2}$
5 $\times$ 4
5 $\times$ 3
5 $\times$ $2\frac{1}{2}$
* 6 $\times$ 6
6 $\times$ 5
6 $\times$ 4
* 7 $\times$ 7
7 $\times$ 6
* 8 $\times$ 8
8 $\times$ 7
8 $\times$ 6
* 9 $\times$ 9
* 10 $\times$ 10
10 $\times$ 8
* 12 $\times$ 12

### 45° ELBOWS

Size, Inches.....	* $\frac{1}{4}$	* $\frac{3}{8}$	* $\frac{1}{2}$	* $\frac{3}{4}$	* 1	* $1\frac{1}{4}$	* $1\frac{1}{2}$	* 2	* $2\frac{1}{2}$	* 3
Size, Inches.....	* $3\frac{1}{2}$	* 4	* $4\frac{1}{2}$	* 5	* 6	* 7	* 8	* 9	* 10	* 12

### 60° AND 22½° ELBOWS

Size, Inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
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### PITCHED ELBOWS

Size, Inches.....	$\frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{3}{4}$	$1 \times \frac{3}{4}$	$1 \frac{1}{4} \times 1$	$1\frac{1}{4}$	$1\frac{1}{2} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{2}$
Size, Inches.....	$2 \times 1\frac{1}{2}$	2	$2\frac{1}{2} \times 2$	$2\frac{1}{2}$	$3 \times 2\frac{1}{2}$	3	$3\frac{1}{2} \times 3$	$3\frac{1}{2}$	4

### RIGHT AND LEFT ELBOWS

Size, Inches.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
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Such sizes as are marked with an \* are carried in stock Galvanized.

# LIST OF SIZES

## STANDARD CAST IRON FITTINGS

### TEES

In describing Tees, the run is first named, then the outlet, thus:

$$\frac{1}{2} \text{ T } \frac{1}{2} = \frac{1}{2} \times \frac{3}{4}$$

$\frac{3}{4}$



$$\frac{1}{2} \text{ T } \frac{3}{8} = \frac{1}{2} \times \frac{3}{8} \times \frac{3}{4}$$

$\frac{3}{4}$



Size	Size	Size	Size
* $\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$	*1 $\times \frac{3}{4} \times 1$	*1 $\times 1 \times 1\frac{1}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{2}$
* $\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	*1 $\times \frac{3}{4} \times \frac{3}{4}$	1 $\times \frac{3}{4} \times 1\frac{1}{4}$	*1 $\times 1 \times 1\frac{1}{2}$
$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	*1 $\times \frac{3}{4} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	1 $\times \frac{3}{4} \times 1\frac{1}{2}$
* $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	1 $\times \frac{1}{2} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{2}$
* $\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	*1 $\times \frac{1}{2} \times \frac{3}{4}$	* $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	*2 $\times 2 \times 2$
* $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	1 $\times \frac{1}{2} \times \frac{1}{2}$	* $1\frac{1}{2} \times 1\frac{1}{2} \times 1$	*2 $\times 2 \times 1\frac{1}{2}$
$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{2}$	1 $\times \frac{3}{8} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	*2 $\times 2 \times 1\frac{1}{4}$
$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	1 $\times \frac{1}{4} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	*2 $\times 2 \times 1$
$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{2}$	* $\frac{3}{4} \times \frac{3}{4} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	*2 $\times 2 \times \frac{3}{4}$
	$\frac{3}{4} \times \frac{1}{2} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	*2 $\times 2 \times \frac{1}{2}$
	$\frac{1}{2} \times \frac{1}{2} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{4} \times 1$	*2 $\times 2 \times \frac{1}{4}$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	* $1\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$	*2 $\times 1\frac{1}{2} \times 2$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times 1$	* $1\frac{1}{2} \times 1\frac{1}{4} \times \frac{1}{2}$	*2 $\times 1\frac{1}{2} \times 1\frac{1}{2}$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1 \times 1\frac{1}{2}$	*2 $\times 1\frac{1}{2} \times 1\frac{1}{4}$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1 \times 1\frac{1}{4}$	*2 $\times 1\frac{1}{2} \times 1$
* $\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{8}$	$1\frac{1}{2} \times 1 \times 1$	*2 $\times 1\frac{1}{2} \times \frac{3}{4}$
* $\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	* $1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	$1\frac{1}{2} \times 1 \times \frac{3}{4}$	2 $\times 1\frac{1}{2} \times \frac{1}{2}$
$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{4}$	$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	$1\frac{1}{2} \times 1 \times \frac{1}{2}$	*2 $\times 1\frac{1}{4} \times 2$
$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{8}$	* $1\frac{1}{4} \times 1 \times 1$	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$	2 $\times 1\frac{1}{4} \times 1\frac{1}{2}$
$\frac{3}{4} \times \frac{1}{4} \times \frac{3}{4}$	* $1\frac{1}{4} \times 1 \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{4}$	*2 $\times 1\frac{1}{4} \times 1\frac{1}{4}$
* $\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	* $1\frac{1}{4} \times 1 \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{3}{4} \times 1$	2 $\times 1\frac{1}{4} \times 1$
	* $1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	2 $\times 1\frac{1}{4} \times \frac{3}{4}$
*1 $\times 1 \times 1$	$1\frac{1}{4} \times \frac{3}{4} \times 1$	$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{2}$	*2 $\times 1 \times 2$
*1 $\times 1 \times \frac{3}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{4}$	2 $\times 1 \times 1\frac{1}{2}$
*1 $\times 1 \times \frac{1}{2}$	* $1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{2} \times \frac{3}{8} \times 1\frac{1}{2}$	2 $\times 1 \times 1\frac{1}{4}$
*1 $\times 1 \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{1}{4} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1 \times 1\frac{1}{2}$	2 $\times 1 \times 1$
*1 $\times 1 \times \frac{1}{4}$	$1\frac{1}{4} \times \frac{1}{2} \times 1$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{2}$	2 $\times 1 \times \frac{3}{4}$

Such sizes as are marked with an \* are carried in stock Galvanized.



# LIST OF SIZES

## STANDARD CAST IRON FITTINGS

### TEES

CONTINUED

Size	Size	Size	Size
2 X $\frac{3}{4}$ X 2	$2\frac{1}{2}$ X $1\frac{1}{4}$ X $1\frac{1}{2}$	3 X $1\frac{1}{4}$ X 3	*4 X 4 X $2\frac{1}{2}$
2 X $\frac{3}{4}$ X $1\frac{1}{2}$	$2\frac{1}{2}$ X 1 X $2\frac{1}{2}$	3 X 1 X 3	*4 X 4 X 2
2 X $\frac{1}{2}$ X $1\frac{1}{2}$	$2\frac{1}{2}$ X 1 X 2	$2\frac{1}{2}$ X $2\frac{1}{2}$ X 3	*4 X 4 X $1\frac{1}{2}$
2 X $\frac{1}{4}$ X 2	$2\frac{1}{2}$ X $\frac{3}{4}$ X $2\frac{1}{2}$	$2\frac{1}{2}$ X 2 X 3	*4 X 4 X $1\frac{1}{4}$
2 X $\frac{1}{2}$ X 2	$2\frac{1}{2}$ X $\frac{1}{2}$ X $2\frac{1}{2}$	$2\frac{1}{2}$ X $1\frac{1}{2}$ X 3	*4 X 4 X 1
* $1\frac{1}{2}$ X $1\frac{1}{2}$ X 2	*2 X 2 X $2\frac{1}{2}$	*2 X 2 X 3	*4 X 4 X $\frac{3}{4}$
$1\frac{1}{2}$ X $1\frac{1}{4}$ X 2	2 X $1\frac{1}{2}$ X $2\frac{1}{2}$		4 X $3\frac{1}{2}$ X 4
$1\frac{1}{2}$ X 1 X 2	2 X $1\frac{1}{4}$ X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X $3\frac{1}{2}$	4 X $3\frac{1}{2}$ X $3\frac{1}{2}$
$1\frac{1}{2}$ X $\frac{3}{4}$ X 2	2 X 1 X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X 3	4 X $3\frac{1}{2}$ X 3
$1\frac{1}{4}$ X $1\frac{1}{4}$ X 2	2 X $\frac{3}{4}$ X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X $2\frac{1}{2}$	4 X $3\frac{1}{2}$ X $2\frac{1}{2}$
$1\frac{1}{4}$ X 1 X 2	$1\frac{1}{2}$ X $1\frac{1}{2}$ X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X 2	4 X $3\frac{1}{2}$ X 2
$1\frac{1}{4}$ X $\frac{3}{4}$ X 2	$1\frac{1}{2}$ X $1\frac{1}{4}$ X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X $1\frac{1}{2}$	4 X $3\frac{1}{2}$ X $1\frac{1}{2}$
1 X 1 X 2	$1\frac{1}{2}$ X 1 X $2\frac{1}{2}$	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X $1\frac{1}{4}$	4 X $3\frac{1}{2}$ X $1\frac{1}{4}$
1 X $\frac{3}{4}$ X 2		* $3\frac{1}{2}$ X $3\frac{1}{2}$ X 1	4 X $3\frac{1}{2}$ X 1
$\frac{3}{4}$ X $\frac{3}{4}$ X 2	*3 X 3 X 3	* $3\frac{1}{2}$ X $3\frac{1}{2}$ X $\frac{3}{4}$	4 X 3 X 4
	*3 X 3 X $2\frac{1}{2}$	$3\frac{1}{2}$ X 3 X $3\frac{1}{2}$	4 X 3 X $3\frac{1}{2}$
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X $2\frac{1}{2}$	*3 X 3 X 2	$3\frac{1}{2}$ X 3 X 3	*4 X 3 X 3
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X 2	*3 X 3 X $1\frac{1}{2}$	$3\frac{1}{2}$ X 3 X $2\frac{1}{2}$	*4 X 3 X $2\frac{1}{2}$
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X $1\frac{1}{2}$	*3 X 3 X $1\frac{1}{4}$	$3\frac{1}{2}$ X 3 X 2	*4 X 3 X 2
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X $1\frac{1}{4}$	*3 X 3 X 1	$3\frac{1}{2}$ X 3 X $1\frac{1}{2}$	4 X 3 X $1\frac{1}{2}$
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X 1	*3 X 3 X $\frac{3}{4}$	$3\frac{1}{2}$ X 3 X $1\frac{1}{4}$	4 X 3 X $1\frac{1}{4}$
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X $\frac{3}{4}$	*3 X 3 X $\frac{1}{2}$	$3\frac{1}{2}$ X 3 X 1	4 X 3 X 1
* $2\frac{1}{2}$ X $2\frac{1}{2}$ X $\frac{1}{2}$	3 X $2\frac{1}{2}$ X 3	$3\frac{1}{2}$ X 3 X $\frac{3}{4}$	4 X 3 X $\frac{3}{4}$
$2\frac{1}{2}$ X 2 X $2\frac{1}{2}$	*3 X $2\frac{1}{2}$ X $2\frac{1}{2}$	$3\frac{1}{2}$ X $2\frac{1}{2}$ X $3\frac{1}{2}$	4 X $2\frac{1}{2}$ X 4
$2\frac{1}{2}$ X 2 X 2	*3 X $2\frac{1}{2}$ X 2	$3\frac{1}{2}$ X $2\frac{1}{2}$ X 3	4 X $2\frac{1}{2}$ X $3\frac{1}{2}$
* $2\frac{1}{2}$ X 2 X $1\frac{1}{2}$	*3 X $2\frac{1}{2}$ X $1\frac{1}{2}$	$3\frac{1}{2}$ X $2\frac{1}{2}$ X $2\frac{1}{2}$	4 X $2\frac{1}{2}$ X 3
* $2\frac{1}{2}$ X 2 X $1\frac{1}{4}$	*3 X $2\frac{1}{2}$ X $1\frac{1}{4}$	$3\frac{1}{2}$ X $2\frac{1}{2}$ X 2	4 X $2\frac{1}{2}$ X $2\frac{1}{2}$
* $2\frac{1}{2}$ X 2 X 1	3 X $2\frac{1}{2}$ X 1	$3\frac{1}{2}$ X 2 X $3\frac{1}{2}$	4 X $2\frac{1}{2}$ X 2
$2\frac{1}{2}$ X 2 X $\frac{3}{4}$	3 X $2\frac{1}{2}$ X $\frac{3}{4}$	$3\frac{1}{2}$ X $1\frac{1}{2}$ X $3\frac{1}{2}$	4 X $2\frac{1}{2}$ X $1\frac{1}{2}$
$2\frac{1}{2}$ X 2 X $\frac{1}{2}$	*3 X 2 X 3	$3\frac{1}{2}$ X $1\frac{1}{4}$ X $3\frac{1}{2}$	4 X $2\frac{1}{2}$ X $1\frac{1}{4}$
$2\frac{1}{2}$ X $1\frac{1}{2}$ X $2\frac{1}{2}$	3 X 2 X $2\frac{1}{2}$	$3\frac{1}{2}$ X 1 X $3\frac{1}{2}$	4 X $2\frac{1}{2}$ X 1
$2\frac{1}{2}$ X $1\frac{1}{2}$ X 2	*3 X 2 X 2	3 X 3 X $3\frac{1}{2}$	*4 X 2 X 4
$2\frac{1}{2}$ X $1\frac{1}{2}$ X $1\frac{1}{2}$	3 X 2 X $1\frac{1}{2}$		4 X 2 X 3
$2\frac{1}{2}$ X $1\frac{1}{2}$ X $1\frac{1}{4}$	3 X 2 X $1\frac{1}{4}$		4 X 2 X $2\frac{1}{2}$
$2\frac{1}{2}$ X $1\frac{1}{2}$ X 1	3 X 2 X 1		4 X 2 X 2
$2\frac{1}{2}$ X $1\frac{1}{2}$ X $\frac{3}{4}$	3 X $1\frac{1}{2}$ X 3	*4 X 4 X 4	
$2\frac{1}{2}$ X $1\frac{1}{2}$ X $\frac{1}{2}$	3 X $1\frac{1}{2}$ X $2\frac{1}{2}$	*4 X 4 X $3\frac{1}{2}$	
$2\frac{1}{2}$ X $1\frac{1}{4}$ X $2\frac{1}{2}$	3 X $1\frac{1}{2}$ X 2	*4 X 4 X 3	
* $2\frac{1}{2}$ X $1\frac{1}{4}$ X 2			

Such sizes as are marked with an \* are carried in stock Galvanized.

# LIST OF SIZES

## STANDARD CAST IRON FITTINGS

### TEES

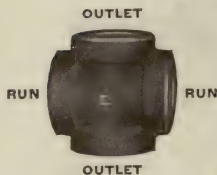
CONTINUED

Size	Size	Size	Size
4 $\times 1\frac{1}{2} \times 4$	5 $\times 4 \times 2$	6 $\times 4 \times 3$	8 $\times 7 \times 8$
4 $\times 1\frac{1}{4} \times 4$	5 $\times 4 \times 1\frac{1}{2}$	6 $\times 3 \times 6$	8 $\times 7 \times 6$
4 $\times 1 \times 4$	5 $\times 3\frac{1}{2} \times 3\frac{1}{2}$	6 $\times 2\frac{1}{2} \times 6$	8 $\times 7 \times 5$
3 $\frac{1}{2} \times 3\frac{1}{2} \times 4$	5 $\times 3 \times 5$	6 $\times 2 \times 6$	8 $\times 7 \times 4$
3 $\times 3 \times 4$	5 $\times 3 \times 4\frac{1}{2}$	5 $\times 5 \times 6$	8 $\times 7 \times 3$
*2 $\frac{1}{2} \times 2\frac{1}{2} \times 4$	5 $\times 3 \times 4$	5 $\times 3\frac{1}{2} \times 6$	8 $\times 6 \times 8$
2 $\times 2 \times 4$	5 $\times 3 \times 3\frac{1}{2}$	4 $\times 4 \times 6$	8 $\times 6 \times 7$
	5 $\times 3 \times 3$		8 $\times 6 \times 6$
	5 $\times 3 \times 2\frac{1}{2}$		8 $\times 5 \times 8$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 4\frac{1}{2}$	5 $\times 3 \times 2$	*7 $\times 7 \times 7$	8 $\times 5 \times 5$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 4$	5 $\times 2\frac{1}{2} \times 5$	7 $\times 7 \times 6$	8 $\times 4 \times 8$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 3\frac{1}{2}$	5 $\times 2\frac{1}{2} \times 4$	7 $\times 7 \times 5$	8 $\times 4 \times 6$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 3$	5 $\times 2\frac{1}{2} \times 3$	7 $\times 7 \times 4$	6 $\times 6 \times 8$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{1}{2}$	5 $\times 2 \times 5$	7 $\times 7 \times 3\frac{1}{2}$	
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 2$	5 $\times 1\frac{1}{2} \times 5$	7 $\times 7 \times 3$	
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{2}$	5 $\times 1\frac{1}{4} \times 5$	7 $\times 7 \times 2\frac{1}{2}$	* 9 $\times 9 \times 9$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{4}$	*4 $\times 4 \times 5$	7 $\times 7 \times 2$	9 $\times 9 \times 7$
*4 $\frac{1}{2} \times 4\frac{1}{2} \times 1$		7 $\times 6 \times 7$	9 $\times 9 \times 6$
4 $\frac{1}{2} \times 4 \times 3$	*6 $\times 6 \times 6$	7 $\times 6 \times 6$	9 $\times 9 \times 5$
4 $\frac{1}{2} \times 4 \times 2$	*6 $\times 6 \times 5$	7 $\times 6 \times 5$	
	*6 $\times 6 \times 4\frac{1}{2}$	7 $\times 6 \times 4$	*10 $\times 10 \times 10$
*5 $\times 5 \times 5$	*6 $\times 6 \times 4$	7 $\times 6 \times 3$	10 $\times 10 \times 8$
*5 $\times 5 \times 4\frac{1}{2}$	*6 $\times 6 \times 3\frac{1}{2}$	7 $\times 5 \times 6$	10 $\times 10 \times 6$
*5 $\times 5 \times 4$	*6 $\times 6 \times 3$	7 $\times 5 \times 5$	10 $\times 10 \times 5$
*5 $\times 5 \times 3\frac{1}{2}$	*6 $\times 6 \times 2\frac{1}{2}$	6 $\times 6 \times 7$	10 $\times 10 \times 4$
*5 $\times 5 \times 3$	*6 $\times 6 \times 2$	5 $\times 5 \times 7$	10 $\times 10 \times 3$
*5 $\times 5 \times 2\frac{1}{2}$	*6 $\times 6 \times 1\frac{1}{2}$		10 $\times 10 \times 2$
*5 $\times 5 \times 2$	*6 $\times 6 \times 1\frac{1}{4}$	* 8 $\times 8 \times 8$	10 $\times 8 \times 8$
*5 $\times 5 \times 1\frac{1}{2}$	*6 $\times 6 \times 1$	8 $\times 8 \times 7$	8 $\times 8 \times 10$
*5 $\times 5 \times 1\frac{1}{4}$	6 $\times 5 \times 6$	8 $\times 8 \times 6$	
*5 $\times 5 \times 1$	6 $\times 5 \times 5$	8 $\times 8 \times 5$	*12 $\times 12 \times 12$
*5 $\times 5 \times \frac{3}{4}$	6 $\times 5 \times 4$	8 $\times 8 \times 4$	12 $\times 12 \times 10$
5 $\times 4 \times 5$	6 $\times 5 \times 3\frac{1}{2}$	8 $\times 8 \times 3\frac{1}{2}$	12 $\times 12 \times 8$
5 $\times 4 \times 4\frac{1}{2}$	6 $\times 5 \times 3$	8 $\times 8 \times 3$	12 $\times 12 \times 6$
*5 $\times 4 \times 4$	6 $\times 5 \times 2\frac{1}{2}$	8 $\times 8 \times 2\frac{1}{2}$	12 $\times 12 \times 5$
5 $\times 4 \times 3\frac{1}{2}$	6 $\times 5 \times 1\frac{1}{2}$	8 $\times 8 \times 2$	12 $\times 12 \times 4$
5 $\times 4 \times 3$	6 $\times 4 \times 6$	8 $\times 8 \times 1\frac{1}{2}$	12 $\times 8 \times 10$
5 $\times 4 \times 2\frac{1}{2}$	6 $\times 4 \times 4$	8 $\times 8 \times 1\frac{1}{4}$	12 $\times 8 \times 8$

Such sizes as are marked with an \* are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 695

# LIST OF SIZES CAST IRON FITTINGS



CROSSES

NOTE.—In describing crosses, the run openings are first named and then the outlets.

Size	Size	Size
* $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	2 $\times 2 \times 1 \times 1$	$2\frac{1}{2} \times 2 \times 1 \times \frac{3}{4}$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	2 $\times 2 \times 1 \times \frac{3}{4}$	$2\frac{1}{2} \times 2 \times \frac{3}{4} \times \frac{3}{4}$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	2 $\times 2 \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 1\frac{1}{2} \times 2 \times 1\frac{1}{2}$
$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	2 $\times 2 \times \frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} \times 1$
*1 $\times 1 \times 1 \times 1$	2 $\times 1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$
1 $\times 1 \times \frac{3}{4} \times \frac{3}{4}$	2 $\times 1\frac{1}{2} \times 1\frac{1}{4} \times 1$	*3 $\times 3 \times 3 \times 3$
1 $\times 1 \times \frac{1}{2} \times \frac{1}{2}$	2 $\times 1\frac{1}{2} \times 1 \times 1$	3 $\times 3 \times 2\frac{1}{2} \times 2\frac{1}{2}$
1 $\times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	2 $\times 1\frac{1}{2} \times 1 \times \frac{3}{4}$	3 $\times 3 \times 2 \times 2$
* $1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	2 $\times 1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	3 $\times 3 \times 2 \times 1\frac{1}{2}$
$1\frac{1}{4} \times 1\frac{1}{4} \times 1 \times 1$	2 $\times 1\frac{1}{4} \times 1 \times \frac{3}{4}$	3 $\times 3 \times 2 \times 1$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	2 $\times 1 \times 1\frac{1}{2} \times 1$	3 $\times 3 \times 1\frac{1}{2} \times 1\frac{1}{2}$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2} \times \frac{1}{2}$	* $2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	3 $\times 3 \times 1\frac{1}{2} \times 1\frac{1}{4}$
$1\frac{1}{4} \times 1 \times 1 \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2 \times 2$	3 $\times 3 \times 1\frac{1}{2} \times 1$
$1\frac{1}{4} \times 1 \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	3 $\times 3 \times 1\frac{1}{2} \times \frac{3}{4}$
$1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	3 $\times 3 \times 1\frac{1}{4} \times 1\frac{1}{4}$
* $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1$	3 $\times 3 \times 1\frac{1}{4} \times 1$
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	3 $\times 3 \times 1\frac{1}{4} \times \frac{3}{4}$
$1\frac{1}{2} \times 1\frac{1}{2} \times 1 \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times 1$	3 $\times 3 \times 1 \times 1$
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$	3 $\times 3 \times \frac{3}{4} \times \frac{3}{4}$
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1 \times 1$	3 $\times 2\frac{1}{2} \times 2\frac{1}{2} \times 2$
$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1 \times \frac{3}{4}$	3 $\times 2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$
$1\frac{1}{2} \times 1\frac{1}{4} \times 1 \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$	3 $\times 2\frac{1}{2} \times 2 \times 2$
$1\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2 \times 2 \times 1\frac{1}{2}$	3 $\times 2\frac{1}{2} \times 2 \times 1\frac{1}{2}$
$1\frac{1}{2} \times 1 \times 1 \times \frac{3}{4}$	$2\frac{1}{2} \times 2 \times 2 \times 1\frac{1}{4}$	3 $\times 2\frac{1}{2} \times 2 \times 1\frac{1}{4}$
$1\frac{1}{2} \times 1 \times 1 \times \frac{1}{2}$	$2\frac{1}{2} \times 2 \times 2 \times 1$	3 $\times 2\frac{1}{2} \times 2 \times 1$
$1\frac{1}{2} \times 1 \times \frac{3}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	3 $\times 2\frac{1}{2} \times 2 \times \frac{3}{4}$
*2 $\times 2 \times 2 \times 2$	$2\frac{1}{2} \times 2 \times 1\frac{1}{2} \times 1\frac{1}{4}$	3 $\times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$
2 $\times 2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2 \times 1\frac{1}{2} \times 1$	3 $\times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$
2 $\times 2 \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2 \times 1\frac{1}{2} \times \frac{3}{4}$	3 $\times 2\frac{1}{2} \times 1\frac{1}{2} \times 1$
2 $\times 2 \times 1\frac{1}{4} \times 1$	$2\frac{1}{2} \times 2 \times 1\frac{1}{4} \times 1\frac{1}{4}$	3 $\times 2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$
	$2\frac{1}{2} \times 2 \times 1\frac{1}{4} \times 1$	3 $\times 2\frac{1}{2} \times 1\frac{1}{4} \times 1$
	$2\frac{1}{2} \times 2 \times 1 \times 1$	3 $\times 2\frac{1}{2} \times 1 \times 1$
		3 $\times 2 \times 2 \times 2$

Such sizes as are marked with an \* are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 695

# LIST OF SIZES

## CAST IRON FITTINGS

### CROSSES

CONTINUED

Size

*3½×3½×3½×3½
3½×3½×3×3
3½×3½×2½×2½
3½×3½×2×2
3½×3½×2×1½
3½×3½×1½×1½
3½×3½×1½×1¼
3½×3½×1½×1
3½×3½×1¼×1¼
3½×3½×1¼×1
3½×3½×1×1
3½×3×2½×2
3½×3×2×2
3½×3×2×1½
3½×3×2×1¼
3½×3×1½×1½
3½×3×1½×1¼
3½×3×1½×1
3½×3×1¼×1¼
3½×3×1¼×1
3½×3×1×1
*4×4×4×4
4×4×3½×3½
4×4×3×3
4×4×2½×2½
4×4×2×2
4×4×2×1½
4×4×1½×1½
4×4×1½×1¼
4×4×1½×1

Size

4×4×1¼×1¼
4×4×1¼×1
4×4×1×1
4×3½×2½×2
4×3½×2×2
4×3½×2×1½
4×3½×2×1¼
4×3½×1½×1½
4×3½×1½×1¼
4×3½×1¼×1¼
4×3½×1¼×1
*4½×4½×4½×4½
*5×5×5×5
5×5×4×4
5×5×3×3
5×5×2½×2½
5×5×2×2
5×5×2×1½
5×5×1½×1½
5×5×1½×1¼
5×5×1×1
5×4×2×2
5×4×2×1½
5×4×1½×1½
5×4×1½×1¼
5×4×1¼×1
5×4×1×1

Size

*6×6×6×6
6×6×5×5
6×6×4×4
6×6×3×3
6×6×2½×2½
6×6×2×2
6×6×2×1½
6×6×1½×1½
6×5×2×2
6×5×2×1½
6×5×1½×1½
*7×7×7×7
7×7×6×6
7×7×5×5
*8×8×8×8
8×8×7×7
8×8×6×6
8×8×5×5
8×8×4×4
*9×9×9×9
*10×10×10×10
10×10×8×8
10×10×7×7
*12×12×12×12
12×12×10×10
12×12×8×8

Such sizes as are marked with an \* are carried in stock Galvanized.

FOR GENERAL DIMENSIONS, SEE PAGE 695

## BLOW-OFF CROSSES

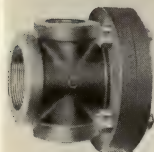
Size

2½×1½
2½×2
2½×2½
3×1½
3×2
4×2

Size

4×2½
5×2½
5×3
6×2½
6×3

Other sizes made to order.



## LIST OF SIZES STANDARD CAST IRON FITTINGS

### REDUCERS



Size	Size
$4\frac{1}{2} \times 4$	6 $\times$ 3
5 $\times$ $4\frac{1}{2}$	6 $\times$ $2\frac{1}{2}$
5 $\times$ 4	6 $\times$ 2
5 $\times$ $3\frac{1}{2}$	7 $\times$ 6
5 $\times$ 3	8 $\times$ 7
5 $\times$ $2\frac{1}{2}$	8 $\times$ 6
5 $\times$ 2	8 $\times$ 4
6 $\times$ 5	10 $\times$ 8
6 $\times$ 4	10 $\times$ 6
6 $\times$ $3\frac{1}{2}$	12 $\times$ 10

### ECCENTRIC REDUCERS

Size	Size
$1\frac{1}{4} \times \frac{3}{4}$	4 $\times$ 2
$1\frac{1}{4} \times 1$	4 $\times$ $2\frac{1}{2}$
$1\frac{1}{2} \times 1$	4 $\times$ 3
$1\frac{1}{2} \times 1\frac{1}{4}$	4 $\times$ $3\frac{1}{2}$
2 $\times$ $\frac{3}{4}$	$4\frac{1}{2} \times 4$
2 $\times$ 1	5 $\times$ 2
2 $\times$ $1\frac{1}{4}$	5 $\times$ $2\frac{1}{2}$
2 $\times$ $1\frac{1}{2}$	5 $\times$ 3
$2\frac{1}{2} \times 1\frac{1}{4}$	5 $\times$ $3\frac{1}{2}$
$2\frac{1}{2} \times 1\frac{1}{2}$	5 $\times$ 4
$2\frac{1}{2} \times 2$	5 $\times$ $4\frac{1}{2}$
3 $\times$ $1\frac{1}{2}$	6 $\times$ $2\frac{1}{2}$
3 $\times$ 2	6 $\times$ 3
3 $\times$ $2\frac{1}{2}$	6 $\times$ $3\frac{1}{2}$
$3\frac{1}{2} \times 1\frac{1}{4}$	6 $\times$ 4
$3\frac{1}{2} \times 1\frac{1}{2}$	6 $\times$ 5
$3\frac{1}{2} \times 2$	7 $\times$ 6
$3\frac{1}{2} \times 2\frac{1}{2}$	8 $\times$ 5
$3\frac{1}{2} \times 3$	8 $\times$ 6
	8 $\times$ 7



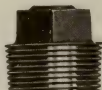
### Y BENDS

Size..... $\frac{1}{2}$  to 12 inch



### CAPS

Size..... 4 to 12 inch



### PLUGS

Size..... $\frac{1}{8}$  to 12 inch



### LOCK NUTS

Size..... $2\frac{1}{2}$  to 12 inch

We also keep in stock: Galvanized Cast Iron Plugs,  $\frac{1}{8}$  to 12 inch; Galvanized Cast Iron Caps, 4 to 12 inch; Galvanized Cast Iron Lock Nuts,  $2\frac{1}{2}$  to 12 inch.



## LIST OF SIZES STANDARD CAST IRON FITTINGS



### BUSHINGS

Reducing one size only, are malleable up to 2½ inch, inclusive.

Size	Size	Size	Size	Size
¼ × ⅛	1½ × ⅜	3 × 1¼	4½ × 4	7 × 5
¾ × ⅛	1½ × ½	3 × 1½		7 × 6
¾ × ¼	1½ × ¾	3 × 2	5 × 1	
	1½ × 1	3 × 2½	5 × 2	8 × 2
1½ × ¼	1½ × 1¼		5 × 2½	8 × 2½
1½ × ⅜		3½ × 1	5 × 3	8 × 3
	2 × ¼	3½ × 1¼	5 × 3½	8 × 4
¾ × ¼	2 × ⅜	3½ × 1½	5 × 4	8 × 5
¾ × ⅜	2 × ½	3½ × 2	5 × 4½	8 × 6
¾ × ½	2 × ¾	3½ × 2½		8 × 7
	2 × 1	3½ × 3	6 × 1½	
1 × ¼	2 × 1¼		6 × 2	9 × 6
1 × ⅜	2 × 1½	4 × 1	6 × 2½	9 × 7
1 × ½		4 × 1¼	6 × 3	9 × 8
1 × ¾	2½ × ½	4 × 1½	6 × 3½	
	2½ × ¾	4 × 2	6 × 4	10 × 4
1¼ × ¼	2½ × 1	4 × 2½	6 × 4½	10 × 5
1¼ × ⅜	2½ × 1¼	4 × 3	6 × 5	10 × 6
1¼ × ½	2½ × 1½	4 × 3½		10 × 7
1¼ × ¾	2½ × 2		7 × 2	10 × 8
1¼ × 1		4½ × 2	7 × 2½	10 × 9
	3 × ½	4½ × 2½	7 × 3	
1½ × ¼	3 × ¾	4½ × 3	7 × 3½	12 × 6
	3 × 1	4½ × 3½	7 × 4	12 × 8
			7 × 4½	12 × 10

We also keep in stock, Galvanized Bushings, ½ to 6 inch, inclusive.



### FACE BUSHINGS

#### MALLEABLE IRON

Size	Size	Size	Size	Size	Size
¾ × ¼	1¼ × ¾	2 × 1¼	3½ × 2	4½ × 4	7 × 5
1½ × ⅜	1¼ × 1	2 × 1½	3½ × 2½		7 × 6
		2½ × 1¼	3½ × 3	*5 × 3	
¾ × ⅜	1½ × ¾	2½ × 1½		5 × 4	8 × 6
¾ × ½	1½ × 1	2½ × 2	*4 × 2	5 × 4½	8 × 7
	1½ × 1¼		4 × 2½		
1 × ½		3 × 1½	4 × 3	6 × 3	10 × 8
1 × ¾	2 × ¾	3 × 2	4 × 3½	*6 × 4	
	2 × 1	3 × 2½		*6 × 5	12 × 10

\*These sizes are made in Cast Iron only.

### ECCENTRIC BUSHINGS

#### CAST IRON

Size	Size	Size	Size	Size
1¼ × ½	2 × ¾	2½ × 1½	3 × 2	4 × 2½
1¼ × ¾	2 × 1			4 × 3
1½ × ½	2 × 1¼	3 × ¾	4 × 1	5 × 2
1½ × ¾		3 × 1	4 × 1¼	5 × 4
	2½ × 1	3 × 1¼	4 × 1½	
2 × ½	2½ × 1¼	3 × 1½	4 × 2	6 × 4

Other sizes made to order.

# AMERICAN STANDARD SPRINKLER FITTINGS

## LIST OF SIZES

### ELBOWS



STYLE A

2½  
3  
3½  
4  
5  
6



STYLE B

2½  
3  
3½  
4  
5  
6



STYLE C

2½  
3  
3½  
4  
5  
6

### TEES



STYLE G

2½  
2½×2½×2  
2½×2 ×2½  
2 ×2 ×2½

3  
3 ×3 ×2½  
3 ×2½×3  
3 ×2½×2½  
3 ×2 ×3  
3 ×2 ×2½  
2½×2½×3  
2½×2 ×3

3½  
3½×3½×3  
3½×3½×2½  
3½×3 ×3½  
3½×3 ×3  
3½×3 ×2½  
3½×2½×3½  
3½×2½×3  
3½×2½×2½  
3½×2 ×3½  
3½×2 ×3  
3 ×3 ×3½  
3 ×2½×3½  
3 ×2 ×3½  
2½×2½×3½

4  
4 ×4 ×3½  
4 ×4 ×3  
4 ×4 ×2½  
4 ×3½×4  
4 ×3½×3½  
4 ×3½×3  
4 ×3½×2½  
4 ×3 ×4  
4 ×3 ×3½  
4 ×3 ×3  
4 ×3 ×2½  
4 ×2½×4  
4 ×2½×3½  
3½×3½×4  
3½×3 ×4  
3½×2½×4  
3 ×3 ×4  
3 ×2½×4

5  
5 ×5 ×4  
5 ×5 ×3½  
5 ×5 ×3  
5 ×5 ×2½  
5 ×4 ×5  
5 ×4 ×4  
5 ×4 ×3½  
5 ×4 ×3  
5 ×4 ×2½  
5 ×3½×5  
5 ×3½×4  
5 ×3½×3½  
5 ×3 ×5  
5 ×3 ×4  
5 ×3 ×3½  
5 ×2½×5  
5 ×2½×4  
4 ×4 ×5  
4 ×3½×5  
4 ×3 ×5  
4 ×2½×5  
3½×3½×5  
3½×3 ×5

6  
6 ×6 ×5  
6 ×6 ×4  
6 ×6 ×3½  
6 ×6 ×3  
6 ×5 ×6  
6 ×5 ×5  
6 ×5 ×4  
6 ×5 ×3½  
6 ×5 ×3  
6 ×4 ×6  
6 ×4 ×5  
6 ×4 ×4  
6 ×3½×6  
6 ×3½×5  
6 ×3 ×6  
5 ×5 ×6  
5 ×4 ×6  
5 ×3½×6  
5 ×3 ×6  
4 ×4 ×6  
4 ×3½×6



STYLE H

2½  
2½×2 ×2½  
3  
3 ×3 ×2½  
3 ×2½×3  
3 ×2½×2½

# AMERICAN STANDARD SPRINKLER FITTINGS

## LIST OF SIZES

### STYLE H CONTINUED

$3\frac{1}{2}$   
 $3\frac{1}{2} \times 3\frac{1}{2} \times 3$   
 $3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$   
 $3\frac{1}{2} \times 3 \times 3\frac{1}{2}$   
 $3\frac{1}{2} \times 3 \times 3$   
 $3\frac{1}{2} \times 3 \times 2\frac{1}{2}$   
 $3\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$   
 $3\frac{1}{2} \times 2\frac{1}{2} \times 3$   
 $3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$

4  
 $4 \times 4 \times 3\frac{1}{2}$   
 $4 \times 4 \times 3$   
 $4 \times 4 \times 2\frac{1}{2}$   
 $4 \times 3\frac{1}{2} \times 4$   
 $4 \times 3\frac{1}{2} \times 3\frac{1}{2}$   
 $4 \times 3\frac{1}{2} \times 3$   
 $4 \times 3\frac{1}{2} \times 2\frac{1}{2}$   
 $4 \times 3 \times 4$   
 $4 \times 3 \times 3\frac{1}{2}$   
 $4 \times 3 \times 3$   
 $4 \times 2\frac{1}{2} \times 4$   
 $4 \times 2\frac{1}{2} \times 3\frac{1}{2}$

5  
 $5 \times 5 \times 4$   
 $5 \times 5 \times 3\frac{1}{2}$   
 $5 \times 5 \times 3$   
 $5 \times 5 \times 2\frac{1}{2}$   
 $5 \times 4 \times 5$   
 $5 \times 4 \times 4$   
 $5 \times 4 \times 3\frac{1}{2}$   
 $5 \times 4 \times 3$   
 $5 \times 3\frac{1}{2} \times 5$   
 $5 \times 3\frac{1}{2} \times 4$   
 $5 \times 3\frac{1}{2} \times 3\frac{1}{2}$

$5 \times 3 \times 5$   
 $5 \times 3 \times 4$   
 $5 \times 2\frac{1}{2} \times 5$

6  
 $6 \times 6 \times 5$   
 $6 \times 6 \times 4$   
 $6 \times 6 \times 3\frac{1}{2}$   
 $6 \times 6 \times 3$   
 $6 \times 5 \times 6$   
 $6 \times 5 \times 5$   
 $6 \times 5 \times 4$   
 $6 \times 5 \times 3$   
 $6 \times 4 \times 6$   
 $6 \times 4 \times 5$   
 $6 \times 4 \times 4$   
 $6 \times 3\frac{1}{2} \times 6$   
 $6 \times 3\frac{1}{2} \times 5$   
 $6 \times 3 \times 5$

The largest opening on run is the flanged opening.



STYLE K

$2\frac{1}{2}$   
 $2\frac{1}{2} \times 2 \times 2\frac{1}{2}$   
 $2 \times 2 \times 2\frac{1}{2}$

3  
 $3 \times 2\frac{1}{2} \times 3$   
 $3 \times 2 \times 3$   
 $2\frac{1}{2} \times 2\frac{1}{2} \times 3$   
 $2\frac{1}{2} \times 2 \times 3$   
  
 $3\frac{1}{2}$   
 $3\frac{1}{2} \times 3 \times 3\frac{1}{2}$   
 $3\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$   
 $3 \times 3 \times 3\frac{1}{2}$   
 $3 \times 2\frac{1}{2} \times 3\frac{1}{2}$   
 $3 \times 2 \times 3\frac{1}{2}$   
 $2\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$

4  
 $4 \times 3 \times 4$   
 $4 \times 2\frac{1}{2} \times 4$   
 $3\frac{1}{2} \times 3\frac{1}{2} \times 4$   
 $3\frac{1}{2} \times 3 \times 4$   
 $3\frac{1}{2} \times 2\frac{1}{2} \times 4$   
 $3 \times 3 \times 4$   
 $3 \times 2\frac{1}{2} \times 4$

5  
 $5 \times 4 \times 5$   
 $5 \times 3\frac{1}{2} \times 5$   
 $5 \times 3 \times 5$   
 $4 \times 4 \times 5$   
 $4 \times 3\frac{1}{2} \times 5$   
 $4 \times 3 \times 5$   
 $3\frac{1}{2} \times 3\frac{1}{2} \times 5$   
 $3\frac{1}{2} \times 3 \times 5$

6  
 $6 \times 5 \times 6$   
 $6 \times 4 \times 6$   
 $6 \times 3\frac{1}{2} \times 6$

$6 \times 3 \times 6$   
 $5 \times 5 \times 6$   
 $5 \times 4 \times 6$   
 $5 \times 3\frac{1}{2} \times 6$   
 $5 \times 3 \times 6$   
 $4 \times 4 \times 6$   
 $4 \times 3\frac{1}{2} \times 6$



STYLE L

$2\frac{1}{2}$   
  
3  
  
 $3\frac{1}{2}$   
 $3\frac{1}{2} \times 3\frac{1}{2} \times 3$

4  
 $4 \times 4 \times 3$   
 $4 \times 3\frac{1}{2} \times 4$   
 $4 \times 3 \times 4$   
  
5  
 $5 \times 5 \times 4$   
 $5 \times 4 \times 5$   
 $5 \times 3\frac{1}{2} \times 5$

6  
 $6 \times 6 \times 5$   
 $6 \times 6 \times 4$   
 $6 \times 5 \times 6$   
 $6 \times 4 \times 6$

# AMERICAN STANDARD SPRINKLER FITTINGS

## LIST OF SIZES

### TEES



STYLE M

4

5

6



STYLE N

3

4

5

5 X5 X4

6

6 X6 X4

### CROSSES



STYLE P

2½

2½ X 2½ X 2½ X 2

3

3 X3 X3 X2½

3 X3 X2½ X 2½

3½

3½ X 3½ X 3½ X 3

3½ X 3½ X 3½ X 2½

3½ X 3½ X 3 X3

3½ X 3½ X 3 X2½

3½ X 3½ X 2½ X 2½

3½ X 2½ X 2½ X 2½

4

4 X4 X4 X3½

4 X4 X4 X3

4 X4 X3½ X 3½

4 X4 X3½ X 3

4 X4 X3½ X 2½

4 X4 X3 X3

4 X4 X3 X2½

4 X3 X2½ X 2½

4 X2½ X 2½ X 2½

5

5 X5 X5 X4

5 X5 X5 X3½

5 X5 X5 X3

5 X5 X4 X4

5 X5 X4 X3½

5 X5 X4 X3

5 X5 X4 X2½

5 X5 X3½ X 3½

5 X5 X3½ X 3

5 X4 X3 X3

5 X3 X2½ X 2½

6

6 X6 X5 X5

6 X6 X5 X4

6 X6 X5 X3½

6 X6 X5 X3

6 X6 X4 X4

6 X6 X4 X3½

6 X5 X4 X4

6 X4 X4 X4

In describing Crosses the run openings are named first, then the outlets.

## LONG SWEEP FITTINGS

## LIST OF SIZES

## ELBOWS



No. 1

1  
1¼  
1½  
2  
2½  
3  
3½  
4  
4½  
5  
6  
7  
8  
9  
10  
12



DOUBLE  
BRANCH  
No. 2

1 × 1 × 1  
1¼ × 1¼ × 1¼  
1 × 1 × 1¼  
1½ × 1½ × 1½  
1¼ × 1¼ × 1½

2 × 2 × 2  
1½ × 1½ × 2

2½ × 2½ × 2½  
2 × 2 × 2½

3 × 3 × 3  
2 × 2 × 3  
2½ × 2½ × 3

3½ × 3½ × 3½

4 × 4 × 4  
3 × 3 × 4  
2½ × 2½ × 4

4½ × 4½ × 4½

5 × 5 × 5

6 × 6 × 6

7 × 7 × 7

8 × 8 × 8

9 × 9 × 9

10 × 10 × 10

12 × 12 × 12

In describing  
No. 2 Double  
Branch El-  
bows the run  
openings are  
named first,  
then the inlet.

## TEES



SINGLE  
SWEEP  
No. 3

A B C  
1 × 1 × 1

1¼ × 1¼ × 1¼  
1¼ × 1¼ × 1  
1¼ × 1 × 1

1½ × 1½ × 1½  
1½ × 1½ × 1¼  
1½ × 1½ × 1  
1½ × 1¼ × 1¼  
1½ × 1¼ × 1

2 × 2 × 2  
2 × 2 × 1½  
2 × 2 × 1¼  
2 × 2 × 1  
2 × 1½ × 1½

2½ × 2½ × 2½  
2½ × 2½ × 2  
2½ × 2½ × 1½  
2½ × 2½ × 1¼  
2½ × 2 × 2  
2½ × 2 × 1½

3 × 3 × 3  
3 × 3 × 2½  
3 × 3 × 2

A B C  
3 × 3 × 1½  
3 × 3 × 1¼  
3 × 2½ × 2

3½ × 3½ × 3½  
3½ × 3½ × 2  
3½ × 3½ × 1½  
3½ × 3½ × 1¼  
3½ × 3 × 2

4 × 4 × 4  
4 × 4 × 3  
4 × 4 × 2½  
4 × 4 × 2  
4 × 4 × 1½  
4 × 3 × 3

4½ × 4½ × 4½

5 × 5 × 5  
5 × 5 × 3  
5 × 5 × 2

6 × 6 × 6  
6 × 6 × 2

7 × 7 × 7

8 × 8 × 8

9 × 9 × 9

10 × 10 × 10

12 × 12 × 12



## LONG SWEEP FITTINGS

## LIST OF SIZES

## TEES



No. 5

1 X1 X1	3 X2½X3	4 X3X2½	6 X6 X6
	3 X2½X2½	4 X2½X4	6 X6 X5
	3 X2½X2	4 X2½X3½	6 X6 X4
	3 X2 X3	3½X3½X4	6 X6 X3½
	3 X2 X2½	3½X3 X4	6 X6 X3
	2½X2½X3	3½X2½X4	6 X5 X6
	2½X2 X3	3 X3 X4	6 X5 X5
		3 X2½X4	6 X5 X4
			6 X5 X3½
			6 X5 X3
			6 X4 X6
			6 X4 X5
			6 X4 X4
			6 X3½X6
			6 X3½X5
			6 X3 X6
			6 X5 X6
			5 X4 X6
			5 X3½X6
			5 X3 X6
			4 X4 X6
			4 X3½X6
			7 X7 X7
			8 X8 X8
			8 X8 X6
			8 X8 X4
			9 X9 X9
			10 X10 X10
			12 X12 X12

## LONG SWEEP FITTINGS

## LIST OF SIZES

## CROSSES



No. 4

	$2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	6 X6 X6 X6
	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	6 X6 X4 X4
	3 X3 X3 X3	7 X7 X7 X7
	3 X3 X1 $\frac{1}{2}$ X1 $\frac{1}{2}$	
		8 X8 X8 X8
		8 X8 X6 X6
		8 X8 X4 X4
	$3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2}$	
1 X1 X1 X1	4 X4 X4 X4	9 X9 X9 X9
	4 X4 X2 $\frac{1}{2}$ X2 $\frac{1}{2}$	
$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$		10 X10 X10 X10
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	5 X5 X5 X5	
	5 X5 X4 X4	
2 X2 X2 X2	5 X5 X3 X3	12 X12 X12 X12

In describing Crosses the run openings are named first, then the outlets.

# LIST OF SIZES EXTRA HEAVY CAST IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



## REDUCING ELBOW

The following Straight and Reducing Elbows are carried in stock. Other sizes will be made to order by bushing in the sand, at a special price, according to quantity wanted.

* $\frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	5 × 5
* $\frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1$	*3 × 3	5 × 4
$\frac{3}{4} \times \frac{1}{2}$	*2 × 2	3 × $2\frac{1}{2}$	6 × 6
*1 × 1	2 × $1\frac{1}{2}$	3 × 2	7 × 7
1 × $\frac{3}{4}$	2 × $1\frac{1}{4}$	$3\frac{1}{2} \times 3\frac{1}{2}$	8 × 8
* $1\frac{1}{4} \times 1\frac{1}{4}$	2 × 1	*4 × 4	10 × 10
$1\frac{1}{4} \times 1$	* $2\frac{1}{2} \times 2\frac{1}{2}$	4 × 3	12 × 12
* $1\frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$4\frac{1}{2} \times 4\frac{1}{2}$	

## 45° ELBOWS

* $\frac{1}{2}$	* $1\frac{1}{4}$	* $2\frac{1}{2}$	*4	6	10
* $\frac{3}{4}$	* $1\frac{1}{2}$	*3	$4\frac{1}{2}$	7	12
*1	*2	$3\frac{1}{2}$	5	8	

## CROSSES

1	2	$3\frac{1}{2}$	5	8
$1\frac{1}{4}$	$2\frac{1}{2}$	4	6	10
$1\frac{1}{2}$	3	$4\frac{1}{2}$	7	12

## Y BENDS

$1\frac{1}{4}$	2	3	6	8
$1\frac{1}{2}$	$2\frac{1}{2}$	4	7	

45° Elbows and Crosses are not carried in stock in reducing sizes, but will be made to order by bushing in the sand from straight patterns, at a special price, according to quantity wanted.

Such sizes as are marked with an \* are carried in stock Galvanized

FOR PRICE LIST OF EXTRA HEAVY CAST IRON FITTINGS, SEE PAGE 343

FOR GENERAL DIMENSIONS, SEE PAGE 696

## EXTRA HEAVY CAST IRON BLOW-OFF CROSSES

$2\frac{1}{2} \times 2\frac{1}{2}$	3 × 2	4 × 2	$4 \times 2\frac{1}{2}$
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FOR PRICE LIST OF EXTRA HEAVY CAST IRON BLOW-OFF CROSSES,  
SEE PAGE 252

# LIST OF SIZES EXTRA HEAVY CAST IRON TEES

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS



## REDUCING TEES

The following Straight and Reducing Tees are carried in stock. Other sizes will be made to order by bushing in the sand, at a special price, according to quantity wanted.

## REDUCING TEES

* $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$3 \times 1\frac{1}{2} \times 2$	$5 \times 2 \times 5$
* $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4}$	$3 \times 1 \times 3$	$6 \times 6 \times 6$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 3$	$6 \times 6 \times 5$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4}$	$2 \times 2 \times 3$	$6 \times 6 \times 4$
* $1 \times 1 \times 1$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2}$	$6 \times 6 \times 3$
$1 \times 1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2 \times 2\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	$6 \times 6 \times 2\frac{1}{2}$
$1 \times 1 \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2 \times 2$	$3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 6 \times 2$
$1 \times 1 \times \frac{1}{4}$	$1\frac{1}{2} \times \frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2 \times 1\frac{1}{2}$	* $4 \times 4 \times 4$	$6 \times 4 \times 6$
$1 \times \frac{3}{4} \times \frac{3}{4}$	* $2 \times 2 \times 2$	$2\frac{1}{2} \times 1\frac{1}{2} \times 2\frac{1}{2}$	$4 \times 4 \times 3$	$6 \times 4 \times 4$
$1 \times \frac{3}{4} \times \frac{1}{2}$	$2 \times 2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{2} \times 2$	$4 \times 4 \times 2\frac{1}{2}$	$7 \times 7 \times 7$
$1 \times \frac{1}{2} \times 1$	$2 \times 2 \times 1\frac{1}{4}$	$2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$4 \times 4 \times 2$	$7 \times 7 \times 5$
$\frac{3}{4} \times \frac{3}{4} \times 1$	$2 \times 2 \times 1$	$2\frac{1}{2} \times \frac{3}{4} \times 2\frac{1}{2}$	$4 \times 4 \times 1\frac{1}{2}$	$8 \times 8 \times 8$
* $1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2 \times 2 \times \frac{3}{4}$	$2 \times 2 \times 2\frac{1}{2}$	$4 \times 4 \times 1\frac{1}{4}$	$8 \times 8 \times 8$
$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	$2 \times 2 \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 2\frac{1}{2}$	$4 \times 4 \times 1$	$8 \times 8 \times 6$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$2 \times 2 \times \frac{1}{4}$	* $3 \times 3 \times 3$	$4 \times 3 \times 4$	$8 \times 8 \times 5$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$2 \times 1\frac{1}{2} \times 2$	$3 \times 3 \times 2\frac{1}{2}$	$4 \times 3 \times 3$	$8 \times 8 \times 4$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	$2 \times 1\frac{1}{2} \times 1\frac{1}{2}$	$3 \times 3 \times 2$	$4 \times 2\frac{1}{2} \times 4$	$8 \times 8 \times 3$
$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2} \times 1$	$3 \times 3 \times 1\frac{1}{2}$	$4 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$8 \times 6 \times 6$
$1\frac{1}{4} \times 1 \times 1$	$2 \times 1\frac{1}{4} \times 1\frac{1}{4}$	$3 \times 3 \times 1\frac{1}{4}$	$4 \times 2 \times 4$	$8 \times 6 \times 4$
$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$2 \times 1 \times 2$	$3 \times 3 \times 1$	$3 \times 3 \times 4$	$10 \times 10 \times 10$
$1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1 \times 1\frac{1}{2}$	$3 \times 2\frac{1}{2} \times 3$	$4\frac{1}{2} \times 4\frac{1}{2} \times 4\frac{1}{2}$	$10 \times 10 \times 8$
$1\frac{1}{4} \times \frac{1}{4} \times 1\frac{1}{4}$	$2 \times \frac{3}{4} \times 2$	$3 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$5 \times 5 \times 5$	$10 \times 10 \times 6$
$1 \times 1 \times 1\frac{1}{4}$	$2 \times \frac{1}{2} \times 2$	$3 \times 2\frac{1}{2} \times 2$	$5 \times 5 \times 4$	$10 \times 10 \times 4$
* $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 2$	$3 \times 2\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 5 \times 3$	$12 \times 12 \times 12$
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 2$	$3 \times 2 \times 3$	$5 \times 5 \times 2\frac{1}{2}$	$12 \times 12 \times 10$
$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	* $2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	$3 \times 2 \times 2$	$5 \times 5 \times 2$	$12 \times 12 \times 8$
	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$3 \times 2 \times 1\frac{1}{2}$	$5 \times 3 \times 5$	$12 \times 12 \times 6$

Such sizes as are marked with an \* are carried in stock Galvanized.

FOR PRICE LIST OF EXTRA HEAVY CAST IRON FITTINGS, SEE PAGE 343

FOR GENERAL DIMENSIONS, SEE PAGE 696

# MALLEABLE IRON FITTINGS

## REVISED CLASSIFICATION

ADOPTED JUNE 5, 1907

### ELBOWS



PLAIN  
GAS



BANDED  
STEAM

	Size	Class
*Gas.....	$\frac{1}{8}$	A
*Gas.....	$\frac{1}{4} \times \frac{1}{8}$	A
*Steam and Gas...	$\frac{1}{4}$	B
*Gas.....	$\frac{3}{8} \times \frac{1}{8}$	A
*Steam and Gas...	$\frac{3}{8} \times \frac{1}{4}$	B
*Steam and Gas...	$\frac{3}{8}$	B
*Gas.....	$\frac{1}{2} \times \frac{1}{8}$	A
*Steam and Gas...	$\frac{1}{2} \times \frac{1}{4}$	B
*Steam and Gas...	$\frac{1}{2} \times \frac{3}{8}$	B
*Steam and Gas...	$\frac{1}{2}$	B
*Gas.....	$\frac{3}{4} \times \frac{3}{8}$	B
*Steam and Gas...	$\frac{3}{4} \times \frac{1}{2}$	B
*Steam and Gas...	$\frac{3}{4}$	C
*Gas.....	$1 \times \frac{3}{8}$	B
*Steam and Gas...	$1 \times \frac{1}{2}$	B
*Steam and Gas...	$1 \times \frac{3}{4}$	C
*Steam and Gas...	1	C
Steam.....	$1\frac{1}{4} \times \frac{1}{2}$	B
*Steam.....	$1\frac{1}{4} \times \frac{3}{4}$	C
*Steam and Gas...	$1\frac{1}{4} \times 1$	C
*Steam and Gas...	$1\frac{1}{4}$	C
*Steam.....	$1\frac{1}{2} \times \frac{3}{4}$	C

	Size	Class
*Steam.....	$1\frac{1}{2} \times 1$	C
*Steam and Gas...	$1\frac{1}{2} \times 1\frac{1}{4}$	C
*Steam and Gas...	$1\frac{1}{2}$	C
*Steam.....	$2 \times 1$	C
*Steam.....	$2 \times 1\frac{1}{4}$	C
*Steam and Gas...	$2 \times 1\frac{1}{2}$	C
*Steam and Gas...	2	C
*Steam.....	$2\frac{1}{2} \times 1\frac{1}{2}$	C
*Steam.....	$2\frac{1}{2} \times 2$	C
*Steam.....	$2\frac{1}{2}$	C
*Steam.....	$3 \times 2$	C
*Steam.....	$3 \times 2\frac{1}{2}$	C
*Steam.....	3	C
Steam.....	$3\frac{1}{2} \times 3$	C
*Steam.....	$3\frac{1}{2}$	C
*Steam.....	$4 \times 3$	C
Steam.....	$4 \times 3\frac{1}{2}$	C
*Steam.....	4	C
Steam.....	$4\frac{1}{2}$	C
*Steam.....	5	C
*Steam.....	6	C

### RIGHT AND LEFT ELBOWS

	Size	Class
*Steam.....	$\frac{1}{4} \times \frac{1}{4}$	A
*Steam.....	$\frac{3}{8} \times \frac{3}{8}$	A
*Steam.....	$\frac{1}{2} \times \frac{1}{2}$	B
*Steam.....	$\frac{3}{4} \times \frac{3}{4}$	B

	Size	Class
*Steam.....	$1 \times 1$	B
*Steam.....	$1\frac{1}{4} \times 1\frac{1}{4}$	C
*Steam.....	$1\frac{1}{2} \times 1\frac{1}{2}$	C
*Steam.....	$2 \times 2$	C

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.



# MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED



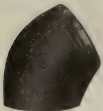
**B STREET  
ELBOWS**

A	A	B	Class
*Banded	$\frac{1}{8}$		A
*Banded	$\frac{1}{4}$		B
*Banded	$\frac{3}{8}$		B
*Banded	$\frac{1}{2}$		B
*Banded	$\frac{3}{4} \times \frac{1}{2}$		B
*Banded	$\frac{3}{4}$		B
*Banded	$1 \times \frac{1}{2}$		B
*Banded	$1 \times \frac{3}{4}$		B
*Banded	1		C
Banded	$1\frac{1}{4} \times \frac{3}{4}$		C
*Banded	$1\frac{1}{4} \times 1$		C
*Banded	$1\frac{1}{4}$		C
*Banded	$1\frac{1}{2} \times 1\frac{1}{4}$		C
*Banded	$1\frac{1}{2}$		C
*Banded	$2 \times 1\frac{1}{4}$		C
*Banded	$2 \times 1\frac{1}{2}$		C
*Banded	2		C
*Banded	$2\frac{1}{2}$		C
*Banded	$2\frac{1}{2} \times 2$		C
*Banded	3		C
Banded	3	$\times 2\frac{1}{2}$	C
Banded	4		C
Banded	4	$\times 3$	C



**45°  
STREET  
ELBOWS**

	Size	Class
*Banded	$\frac{3}{8}$	A
*Banded	$\frac{1}{2}$	B
*Banded	$\frac{3}{4}$	B
*Banded	1	B
*Banded	$1\frac{1}{4}$	B
*Banded	$1\frac{1}{2}$	B
*Banded	2	B
Banded	3	B
Banded	4	B



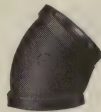
**60°  
ELBOWS**

	Size	Class
Steam	$\frac{1}{4}$	B
*Gas	$\frac{1}{4}$	B
*Gas	$\frac{1}{2}$	B
*Gas	2	B



**ELBOWS  
WITH SIDE OUTLET**

	Size	Class
Gas	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	B
*Gas	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B
*Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	B
*Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	B
Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	B
*Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	B
*Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	B
Gas	$1 \times 1 \times \frac{3}{4}$	B
*Gas	$1 \times 1 \times 1$	B
Gas	$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	B
*Gas	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	B
*Gas	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	B
*Gas	$2 \times 2 \times 2$	B



**45°  
ELBOWS**

	Size	Class
*Steam	$\frac{1}{4}$	B
*Steam	$\frac{3}{8}$	B
*Steam and Gas	$\frac{1}{2}$	B
*Steam and Gas	$\frac{3}{4}$	B
*Steam and Gas	1	B
*Steam and Gas	$1\frac{1}{4}$	B
*Steam and Gas	$1\frac{1}{2}$	B
*Steam and Gas	2	B
*Steam	$2\frac{1}{2}$	C
*Steam	3	C
*Steam	$3\frac{1}{2}$	C
*Steam	4	C
Steam	$4\frac{1}{2}$	C
*Steam	5	C
*Steam	6	C

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

## REVISED CLASSIFICATION, CONTINUED



PLAIN  
GAS

### TEES



BANDED  
STEAM

In describing Tees the run is first named, then the outlet, thus:

$$\frac{1}{2} \text{ T } \frac{1}{2} = \frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$$

$$\frac{1}{2} \text{ T } \frac{3}{8} = \frac{1}{2} \times \frac{3}{8} \times \frac{3}{4}$$

	Size	Class		Size	Class
*Gas.....	$\frac{1}{8} \times \frac{1}{8} \times \frac{1}{8}$	A	*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	B
Gas.....	$\frac{1}{8} \times \frac{1}{8} \times \frac{1}{4}$	A	*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	B
*Gas.....	$\frac{1}{4} \times \frac{1}{4} \times \frac{1}{8}$	A	*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	C
*Steam and Gas	$\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$	B	*Steam.....	$\frac{1}{2} \times \frac{1}{2} \times 1$	B
*Gas.....	$\frac{1}{4} \times \frac{1}{4} \times \frac{3}{8}$	B	*Gas.....	$\frac{3}{4} \times \frac{3}{8} \times 1$	B
*Gas.....	$\frac{3}{8} \times \frac{1}{4} \times \frac{1}{4}$	B	*Gas.....	$\frac{3}{4} \times \frac{1}{2} \times 1$	B
*Gas.....	$\frac{3}{8} \times \frac{1}{4} \times \frac{3}{8}$	B	*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times 1$	C
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{8}$	A	*Gas.....	$1 \times \frac{3}{8} \times \frac{1}{2}$	B
*Steam and Gas	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	B	*Gas.....	$1 \times \frac{3}{8} \times \frac{3}{4}$	B
*Steam and Gas	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B	*Steam and Gas	$1 \times \frac{3}{8} \times 1$	B
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{2}$	B	*Gas.....	$1 \times \frac{1}{2} \times \frac{3}{8}$	B
*Gas.....	$\frac{1}{2} \times \frac{1}{4} \times \frac{1}{2}$	B	*Steam and Gas	$1 \times \frac{1}{2} \times \frac{1}{2}$	B
*Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{4}$	B	*Steam and Gas	$1 \times \frac{1}{2} \times \frac{3}{4}$	B
*Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	B	*Steam and Gas	$1 \times \frac{1}{2} \times 1$	B
*Steam and Gas	$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{2}$	B	*Gas.....	$1 \times \frac{3}{4} \times \frac{3}{8}$	B
*Steam and Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	B	*Steam and Gas	$1 \times \frac{3}{4} \times \frac{1}{2}$	B
*Steam and Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	B	*Steam and Gas	$1 \times \frac{3}{4} \times \frac{3}{4}$	C
*Steam and Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	B	*Steam and Gas	$1 \times \frac{3}{4} \times 1$	C
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{4}$	B	*Gas.....	$1 \times 1 \times \frac{1}{4}$	B
*Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{4}$	B	*Steam and Gas	$1 \times 1 \times \frac{3}{8}$	B
*Steam and Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{4}$	B	*Steam and Gas	$1 \times 1 \times \frac{1}{2}$	B
*Steam and Gas	$\frac{3}{4} \times \frac{1}{4} \times \frac{3}{4}$	B	*Steam and Gas	$1 \times 1 \times \frac{3}{4}$	C
*Gas.....	$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{8}$	B	*Steam and Gas	$1 \times 1 \times 1$	C
*Gas.....	$\frac{3}{4} \times \frac{3}{8} \times \frac{1}{2}$	B	Steam.....	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	C
*Gas.....	$\frac{3}{4} \times \frac{3}{8} \times \frac{3}{4}$	B	*Steam.....	$1 \times \frac{3}{4} \times 1\frac{1}{4}$	C
*Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{4}$	B	*Steam and Gas	$1 \times 1 \times 1\frac{1}{4}$	C
*Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	B	*Steam and Gas	$1\frac{1}{4} \times \frac{3}{8} \times 1\frac{1}{4}$	B
*Steam and Gas	$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	B	*Steam.....	$1\frac{1}{4} \times \frac{1}{2} \times 1$	B
*Steam and Gas	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{4}$	B	*Steam.....	$1\frac{1}{4} \times \frac{1}{2} \times 1\frac{1}{4}$	B
*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	B			

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

## REVISED CLASSIFICATION, CONTINUED

### TEES

#### CONTINUED

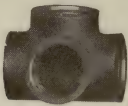
	Size	Class		Size	Class
*Steam.....	1 $\frac{1}{4}$ X 3 $\frac{3}{4}$ X 3 $\frac{3}{4}$	C	*Steam and Gas 2	2 X 2 X 3 $\frac{3}{4}$	C
*Steam.....	1 $\frac{1}{4}$ X 3 $\frac{3}{4}$ X 1	C	*Steam and Gas 2	2 X 2 X 1	C
*Steam.....	1 $\frac{1}{4}$ X 3 $\frac{3}{4}$ X 1 $\frac{1}{4}$	C	*Steam and Gas 2	2 X 2 X 1 $\frac{1}{4}$	C
*Gas.....	1 $\frac{1}{4}$ X 1 X 3 $\frac{3}{8}$	B	*Steam and Gas 2	2 X 2 X 1 $\frac{1}{2}$	C
*Steam.....	1 $\frac{1}{4}$ X 1 X 1 $\frac{1}{2}$	B	*Steam and Gas 2	2 X 2 X 2	C
*Steam.....	1 $\frac{1}{4}$ X 1 X 3 $\frac{3}{4}$	C	*Steam.....	2 X 2 X 2 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 X 1	C	Steam.....	2 $\frac{1}{2}$ X 2 X 1 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 X 1 $\frac{1}{4}$	C	Steam.....	2 $\frac{1}{2}$ X 2 X 2	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 $\frac{1}{4}$ X 3 $\frac{3}{8}$	B	Steam.....	2 $\frac{1}{2}$ X 1 $\frac{1}{2}$ X 2 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 $\frac{1}{4}$ X 1 $\frac{1}{2}$	B	*Steam.....	2 $\frac{1}{2}$ X 2 X 2 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 $\frac{1}{4}$ X 3 $\frac{3}{4}$	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 3 $\frac{3}{4}$	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 $\frac{1}{4}$ X 1	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 1	C
*Steam and Gas 1 $\frac{1}{4}$	1 X 1 $\frac{1}{4}$ X 1 $\frac{1}{4}$	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 1 $\frac{1}{4}$	C
*Steam.....	1 X 1 X 1 $\frac{1}{2}$	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 1 $\frac{1}{2}$	C
*Steam.....	1 $\frac{1}{4}$ X 1 X 1 $\frac{1}{2}$	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 2	C
*Steam.....	1 $\frac{1}{4}$ X 1 $\frac{1}{4}$ X 1 $\frac{1}{2}$	C	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 2 $\frac{1}{2}$	C
Steam.....	1 $\frac{1}{2}$ X 3 $\frac{3}{8}$ X 1 $\frac{1}{2}$	B	*Steam.....	2 $\frac{1}{2}$ X 2 $\frac{1}{2}$ X 3	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{2}$ X 1 $\frac{1}{2}$	B	*Steam.....	2 X 2 X 3	C
*Steam.....	1 $\frac{1}{2}$ X 3 $\frac{3}{4}$ X 3 $\frac{3}{4}$	C	*Steam.....	3 X 2 X 3	C
*Steam.....	1 $\frac{1}{2}$ X 3 $\frac{3}{4}$ X 1 $\frac{1}{2}$	C	Steam.....	3 X 2 $\frac{1}{2}$ X 2	C
*Steam.....	1 $\frac{1}{2}$ X 1 X 1	C	Steam.....	3 X 2 $\frac{1}{2}$ X 3	C
*Steam.....	1 $\frac{1}{2}$ X 1 X 1 $\frac{1}{4}$	C	*Steam.....	3 X 3 X 3 $\frac{3}{4}$	C
*Steam.....	1 $\frac{1}{2}$ X 1 X 1 $\frac{1}{2}$	C	*Steam.....	3 X 3 X 1	C
Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$ X 1 $\frac{1}{2}$	B	*Steam.....	3 X 3 X 1 $\frac{1}{4}$	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$ X 3 $\frac{3}{4}$	C	*Steam.....	3 X 3 X 1 $\frac{1}{2}$	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$ X 1	C	*Steam.....	3 X 3 X 2	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$ X 1 $\frac{1}{4}$	C	*Steam.....	3 X 3 X 2 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{4}$ X 1 $\frac{1}{2}$	C	*Steam.....	3 X 3 X 3	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{2}$ X 3 $\frac{3}{8}$	B	Steam.....	3 $\frac{1}{2}$ X 3 $\frac{1}{2}$ X 2 $\frac{1}{2}$	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{2}$ X 1 $\frac{1}{2}$	B	Steam.....	3 $\frac{1}{2}$ X 3 $\frac{1}{2}$ X 3	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{2}$ X 3 $\frac{3}{4}$	C	*Steam.....	3 $\frac{1}{2}$ X 3 $\frac{1}{2}$ X 3 $\frac{1}{2}$	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{2}$ X 1	C	Steam.....	4 X 3 X 4	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{2}$ X 1 $\frac{1}{4}$	C	Steam.....	4 X 3 X 3	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{2}$ X 1 $\frac{1}{2}$	C	*Steam.....	4 X 4 X 1	C
*Steam.....	1 X 1 X 2	C	*Steam.....	4 X 4 X 1 $\frac{1}{4}$	C
*Steam.....	1 $\frac{1}{4}$ X 1 $\frac{1}{4}$ X 2	C	*Steam.....	4 X 4 X 1 $\frac{1}{2}$	C
*Steam.....	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$ X 2	C	*Steam.....	4 X 4 X 2	C
*Steam and Gas 1 $\frac{1}{2}$	1 X 1 $\frac{1}{2}$ X 2	C	*Steam.....	4 X 4 X 2 $\frac{1}{2}$	C
Steam.....	2 X 3 $\frac{3}{8}$ X 2	B	*Steam.....	4 X 4 X 3	C
*Steam.....	2 X 1 $\frac{1}{2}$ X 2	B	Steam.....	4 X 4 X 3 $\frac{1}{2}$	C
*Steam.....	2 X 3 $\frac{3}{4}$ X 2	C	*Steam.....	4 X 4 X 4	C
*Steam.....	2 X 1 X 2	C	Steam.....	4 $\frac{1}{2}$ X 4 $\frac{1}{2}$ X 4 $\frac{1}{2}$	C
*Steam.....	2 X 1 $\frac{1}{4}$ X 1 $\frac{1}{4}$	C	Steam.....	5 X 5 X 2	C
*Steam.....	2 X 1 $\frac{1}{4}$ X 1 $\frac{1}{2}$	C	Steam.....	5 X 5 X 3	C
*Steam.....	2 X 1 $\frac{1}{4}$ X 2	C	*Steam.....	5 X 5 X 4	C
*Steam.....	2 X 1 $\frac{1}{2}$ X 1	C	*Steam.....	5 X 5 X 5	C
*Steam.....	2 X 1 $\frac{1}{2}$ X 1 $\frac{1}{4}$	C	Steam.....	6 X 6 X 2	C
*Steam and Gas 2	1 X 1 $\frac{1}{2}$ X 1 $\frac{1}{2}$	C	*Steam.....	6 X 6 X 2 $\frac{1}{2}$	C
*Steam and Gas 2	1 X 1 $\frac{1}{2}$ X 2	C	Steam.....	6 X 6 X 3	C
Steam.....	2 X 2 X 3 $\frac{3}{8}$	B	*Steam.....	6 X 6 X 4	C
*Steam.....	2 X 2 X 1 $\frac{1}{2}$	B	*Steam.....	6 X 6 X 6	C

In ordering be particular to mention Steam or Gas, Black or Galvanized.

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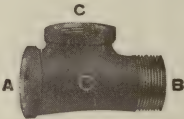
MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION CONTINUED



FOUR-WAY TEES

	Size	Class		Size	Class
*Gas.....	$\frac{3}{8}$	B	*Gas.....	$1\frac{1}{4}$	B
*Gas.....	$\frac{1}{2}$	B	*Gas.....	$1\frac{1}{2}$	B
*Gas.....	$\frac{3}{4}$	B	*Gas.....	2	B
*Gas.....	1	B			



SERVICE TEES

	A	B	C	Class		A	B	C	Class
*Banded.....	$\frac{3}{8} \times$	$\frac{3}{8} \times$	$\frac{3}{8}$	B	Banded.....	$1\frac{1}{4} \times 1$	$\times 1$		C
*Banded.....	$\frac{1}{2} \times$	$\frac{1}{2} \times$	$\frac{1}{2}$	B	*Banded.....	$1\frac{1}{2} \times$	$\frac{3}{4} \times 1\frac{1}{2}$		C
*Banded.....	$\frac{3}{4} \times$	$\frac{3}{4} \times$	$\frac{3}{4}$	B	*Banded.....	$1\frac{1}{2} \times 1$	$\times 1\frac{1}{2}$		C
Banded.....	$\frac{3}{4} \times$	$\frac{1}{2} \times$	$\frac{3}{4}$	B	*Banded.....	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$			C
Banded.....	$\frac{3}{4} \times$	$\frac{3}{4} \times 1$		B	*Banded.....	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$			C
*Banded.....	1	$\times \frac{3}{4} \times 1$		B	*Banded.....	2	$\times 1\frac{1}{2} \times 2$		C
Banded.....	1	$\times 1 \times \frac{3}{4}$		B	*Banded.....	2	$\times 2 \times 2$		C
*Banded.....	1	$\times 1 \times 1$		C	Banded.....	$2\frac{1}{2} \times 2$	$\times 2\frac{1}{2}$		C
Banded.....	1	$\times 1 \times 1\frac{1}{4}$		C	Banded.....	$2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$			C
*Banded.....	$1\frac{1}{4} \times$	$\frac{3}{4} \times 1\frac{1}{4}$		C	Banded.....	3	$\times 2\frac{1}{2} \times 3$		C
*Banded.....	$1\frac{1}{4} \times 1$	$\times 1\frac{1}{4}$		C	Banded.....	3	$\times 3 \times 3$		C
*Banded.....	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$			C	Banded.....	3	$\times 3 \times 4$		C

OTHER VARIATIONS, SERVICE TEES

	Size		Class
$\frac{3}{4}$ Female $\times \frac{3}{4}$ Female $\times \frac{3}{4}$ Male		Banded.....	B
$1\frac{1}{4}$ Female $\times 1\frac{1}{4}$ Female $\times 1$ Male		Plain .....	C

In ordering, be particular to mention Banded or Plain, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

## REVISED CLASSIFICATION, CONTINUED

### CROSSES



PLAIN  
GAS



BANDED  
STEAM

The outlets of Crosses listed below are the same size, and both are denoted by the last figure.

	Size	Class		Size	Class
*Gas.....	$\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$	B	*Steam.....	$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	C
Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	B	*Steam and Gas	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	C
*Steam and Gas	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B	*Steam.....	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	C
*Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	B	*Steam.....	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	B
*Gas.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	B	*Steam.....	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	C
*Gas.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	B	*Steam.....	$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	C
*Steam and Gas	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	B	*Steam.....	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	C
Gas.....	$\frac{3}{4} \times \frac{3}{8} \times \frac{1}{2}$	B	*Steam and Gas	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	C
*Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	B	*Steam.....	$2 \times 2 \times \frac{1}{2}$	B
*Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{1}{2}$	B	*Steam.....	$2 \times 2 \times \frac{3}{4}$	C
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	B	*Steam.....	$2 \times 2 \times 1$	C
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	B	*Steam.....	$2 \times 2 \times 1\frac{1}{4}$	C
*Steam and Gas	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	B	*Steam and Gas	$2 \times 2 \times 1\frac{1}{2}$	C
Gas.....	$1 \times \frac{1}{2} \times \frac{3}{8}$	B	*Steam and Gas	$2 \times 2 \times 2$	C
Gas.....	$1 \times \frac{3}{4} \times \frac{3}{8}$	B	*Steam.....	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	C
Gas.....	$1 \times \frac{3}{4} \times \frac{1}{2}$	B	*Steam.....	$2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	C
*Gas.....	$1 \times \frac{3}{4} \times \frac{3}{4}$	B	*Steam.....	$3 \times 3 \times 2$	C
*Steam and Gas	$1 \times 1 \times \frac{3}{8}$	B	Steam.....	$3 \times 3 \times 2\frac{1}{2}$	C
*Steam and Gas	$1 \times 1 \times \frac{1}{2}$	B	*Steam.....	$3 \times 3 \times 3$	C
*Steam and Gas	$1 \times 1 \times \frac{3}{4}$	B	Steam.....	$3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2}$	C
*Steam and Gas	$1 \times 1 \times 1$	B	*Steam.....	$4 \times 4 \times 2$	C
*Steam.....	$1\frac{1}{4} \times 1 \times \frac{3}{4}$	C	*Steam.....	$4 \times 4 \times 3$	C
*Steam.....	$1\frac{1}{4} \times 1 \times 1$	C	*Steam.....	$4 \times 4 \times 4$	C
*Steam.....	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{8}$	B	Steam.....	$5 \times 5 \times 5$	C
*Steam.....	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	B	Steam.....	$6 \times 6 \times 6$	C
*Steam.....	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	C			

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.



# MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

## DROP ELBOWS



**FEMALE**

	Size	Drop	Class
*Gas.....	$\frac{1}{4} \times \frac{1}{4}$	B	
Gas.....	$\frac{3}{8} \times \frac{1}{4}$	B	
*Gas.....	$\frac{3}{8} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2}$	B	
*Gas.....	$\frac{3}{4} \times \frac{1}{2}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4}$	B	



**MALE AND FEMALE**

	Size	Drop	Class
*Gas.....	$\frac{1}{4} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{8} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2}$	B	



**LONG DROP ELBOWS**

	Size	Drop	Class
*Gas.....	$\frac{1}{4} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{8} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2}$	B	

## DROP TEES



**FEMALE**

	Size	Drop	Class
Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{1}{4}$	B	
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B	
Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	B	
Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	B	
Gas.....	1 × 1 × $\frac{3}{8}$	B	



**MALE AND FEMALE**

	Size	Drop	Class
Gas.....	$\frac{1}{4} \times \frac{1}{4} \times \frac{3}{8}$	B	
Gas.....	$\frac{3}{8} \times \frac{1}{4} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B	
Gas.....	$\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$	B	
*Gas.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	B	
Gas.....	$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$	B	
*Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	B	
Gas.....	1 × 1 × $\frac{3}{8}$	B	

**LONG DROP TEES**

	Size	Drop	Class
*Gas.....	$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	B	
Gas.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	B	
Gas.....	1 × 1 × $\frac{1}{2}$	B	
Gas.....	1 $\frac{1}{4}$ × 1 $\frac{1}{4}$ × $\frac{1}{2}$	B	

In ordering, be particular to mention Black or Galvanized.  
Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

## REVISED CLASSIFICATION, CONTINUED

### CAPS



	Size	Class
*Gas.....	$\frac{1}{8}$	A
*Gas.....	$\frac{1}{4}$	B
*Gas.....	$\frac{3}{8}$	B
*Gas.....	$\frac{1}{2}$	B
*Gas.....	$\frac{3}{4}$	B
*Gas.....	1	B
*Steam.....	$1\frac{1}{4}$	C
*Steam.....	$1\frac{1}{2}$	C
*Steam.....	2	C
*Steam.....	$2\frac{1}{2}$	C
*Steam.....	3	C
*Steam.....	$3\frac{1}{2}$	C
*Steam.....	4	C
*Steam.....	5	C
*Steam.....	6	C

### REDUCERS



	Size	Class
*Gas.....	$\frac{1}{4} \times \frac{1}{8}$	A
*Gas.....	$\frac{3}{8} \times \frac{1}{8}$	A
*Gas.....	$\frac{3}{8} \times \frac{1}{4}$	B
*Gas.....	$\frac{1}{2} \times \frac{1}{8}$	A
*Gas.....	$\frac{1}{2} \times \frac{1}{4}$	B
*Gas.....	$\frac{1}{2} \times \frac{3}{8}$	B
*Gas.....	$\frac{3}{4} \times \frac{1}{4}$	B
*Gas.....	$\frac{3}{4} \times \frac{3}{8}$	B
*Steam and Gas....	$\frac{3}{4} \times \frac{1}{2}$	B

### REDUCERS

	Size	Class
*Gas.....	$1 \times \frac{1}{4}$	B
*Gas.....	$1 \times \frac{3}{8}$	B
*Gas.....	$1 \times \frac{1}{2}$	B
*Steam and Gas....	$1 \times \frac{3}{4}$	B
*Steam.....	$1\frac{1}{4} \times \frac{3}{8}$	B
*Steam.....	$1\frac{1}{4} \times \frac{1}{2}$	B
*Steam.....	$1\frac{1}{4} \times \frac{3}{4}$	C
*Steam and Gas....	$1\frac{1}{4} \times 1$	C
*Steam.....	$1\frac{1}{2} \times \frac{1}{2}$	B
*Steam.....	$1\frac{1}{2} \times \frac{3}{4}$	C
*Steam.....	$1\frac{1}{2} \times 1$	C
*Steam and Gas....	$1\frac{1}{2} \times 1\frac{1}{4}$	C
*Steam.....	$2 \times \frac{1}{2}$	B
*Steam.....	$2 \times \frac{3}{4}$	C
*Steam.....	$2 \times 1$	C
*Steam.....	$2 \times 1\frac{1}{4}$	C
*Steam.....	$2 \times 1\frac{1}{2}$	C
*Steam.....	$2\frac{1}{2} \times 1$	C
*Steam.....	$2\frac{1}{2} \times 1\frac{1}{4}$	C
*Steam.....	$2\frac{1}{2} \times 1\frac{1}{2}$	C
*Steam.....	$2\frac{1}{2} \times 2$	C
*Steam.....	$3 \times 1$	C
*Steam.....	$3 \times 1\frac{1}{4}$	C
*Steam.....	$3 \times 1\frac{1}{2}$	C
*Steam.....	$3 \times 2$	C
*Steam.....	$3 \times 2\frac{1}{2}$	C
*Steam.....	$3\frac{1}{2} \times 2$	C
Steam.....	$3\frac{1}{2} \times 2\frac{1}{2}$	C
*Steam.....	$3\frac{1}{2} \times 3$	C
*Steam.....	$4 \times 1$	C
*Steam.....	$4 \times 1\frac{1}{4}$	C
*Steam.....	$4 \times 1\frac{1}{2}$	C
*Steam.....	$4 \times 2$	C
*Steam.....	$4 \times 2\frac{1}{2}$	C
*Steam.....	$4 \times 3$	C
*Steam.....	$4 \times 3\frac{1}{2}$	C

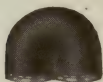
In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

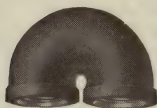
REVISED CLASSIFICATION, CONTINUED

## RETURN BENDS



### CLOSE PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
$\frac{1}{2}$	1	*B	*A
$\frac{3}{4}$	$1\frac{1}{4}$	*B	*B
1	$1\frac{1}{2}$	*B	*B
$1\frac{1}{4}$	$1\frac{3}{4}$	*C	*B
$1\frac{1}{2}$	$2\frac{1}{8}$	*C	*B
2	$2\frac{5}{8}$	*C	*B



### MEDIUM PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
$\frac{1}{2}$	$1\frac{1}{4}$	*B	A
$\frac{3}{4}$	$1\frac{1}{2}$	*B	*B
1	$1\frac{3}{8}$	*B	*B
$1\frac{1}{4}$	$2\frac{1}{4}$	*C	B
$1\frac{1}{2}$	$2\frac{1}{2}$	*C	B
2	3	*C	B



### OPEN PATTERN

Size	Dist. between Centers	R. H. Class	R. & L. Class
$\frac{1}{2}$	$1\frac{1}{2}$	*B	A
$\frac{3}{4}$	2	*B	*B
1	$2\frac{1}{2}$	*B	*B
$1\frac{1}{4}$	3	*C	*B
$1\frac{1}{2}$	$3\frac{1}{2}$	*C	*B
2	4	*C	*B
$2\frac{1}{2}$	$4\frac{1}{2}$	*C	B
3	5	*C	B

## Y BENDS



	Size	Class
*Steam.....	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	B
*Steam.....	$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	B
*Steam.....	1 X 1 X 1	B
*Steam and Gas..	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	B
Steam.....	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	B
*Steam and Gas..	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{4}$	B
*Steam and Gas..	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	B
*Steam and Gas..	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	B
*Steam and Gas..	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	B
*Steam.....	2 X $1\frac{1}{4} \times 1\frac{1}{4}$	B
*Steam and Gas..	2 X $1\frac{1}{4} \times 1\frac{1}{2}$	B
*Steam and Gas..	2 X $1\frac{1}{4} \times 2$	B
*Steam and Gas..	2 X $1\frac{1}{2} \times 1\frac{1}{4}$	B
*Steam and Gas..	2 X $1\frac{1}{2} \times 1\frac{1}{2}$	B
*Steam and Gas..	2 X $1\frac{1}{2} \times 2$	B
*Steam and Gas..	2 X 2 X $1\frac{1}{4}$	B
*Steam and Gas..	2 X 2 X $1\frac{1}{2}$	B
*Steam and Gas..	2 X 2 X 2	B
*Steam.....	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	B
*Steam and Gas..	$2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	B
*Steam.....	3 X 3 X $2\frac{1}{2}$	B
*Steam.....	3 X 3 X 3	B
*Steam.....	4 X 4 X 4	B

## 60° Y BENDS

*Gas.....	2 X 2 X 2	B
*Gas.....	2 X 2 X $1\frac{1}{2}$	B

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

# MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION, CONTINUED

## COUPLINGS



RIGHT AND LEFT



RIGHT HAND

Size	Class
* $\frac{1}{4}$	B
* $\frac{3}{8}$	B
* $\frac{1}{2}$	B
* $\frac{3}{4}$	B
*1	C
* $1\frac{1}{4}$	C
* $1\frac{1}{2}$	C
*2	C
* $2\frac{1}{2}$	C
*3	C

	Size	Class
*Steam and Gas.....	$\frac{1}{4}$	B
*Steam and Gas.....	$\frac{3}{8}$	B
*Steam and Gas.....	$\frac{1}{2}$	B
*Steam and Gas.....	$\frac{3}{4}$	B
*Steam and Gas.....	1	C
*Steam and Gas.....	$1\frac{1}{4}$	C
*Steam and Gas.....	$1\frac{1}{2}$	C
*Steam and Gas.....	2	C
*Steam.....	$2\frac{1}{2}$	C
*Steam.....	3	C

## OFFSETS

All Sizes,  $\frac{3}{4}$ , 1 and  $1\frac{1}{4}$ . . Class B

## LOCK NUTS



Size	Class
$\frac{1}{8}$	A
* $\frac{1}{4}$	B
* $\frac{3}{8}$	B
* $\frac{1}{2}$	B
* $\frac{3}{4}$	B
*1	B
* $1\frac{1}{4}$	B
* $1\frac{1}{2}$	C
*2	C

## EXTENSION PIECES



MALE AND FEMALE

Size	Class
* $\frac{3}{8} \times \frac{3}{8}$	B
* $\frac{1}{2} \times \frac{1}{2}$	B
* $\frac{3}{4} \times \frac{3}{4}$	B

## WASTE NUTS



PLAIN

Size	Class
* $\frac{1}{4}$	B
* $\frac{3}{8}$	B
* $\frac{1}{2}$	B
* $\frac{3}{4}$	B
*1	B
* $1\frac{1}{4}$	B
* $1\frac{1}{2}$	B

## CHANDELIER LOOPS



MALE

Size	Class
$\frac{3}{8}$	B
$\frac{1}{2}$	B

## CHANDELIER HOOKS



Size	Class
$\frac{3}{8}$	B
$\frac{1}{2}$	B

MALE OR FEMALE

## WALL PLATES



Size	Class
$\frac{3}{8}$	B
$\frac{1}{2}$	B
$\frac{3}{4}$	B

In ordering, be particular to mention Steam or Gas, Black or Galvanized.

Such sizes as are marked with an \* are also carried in stock Galvanized.

LIST OF SIZES  
EXTRA HEAVY AND HYDRAULIC  
MALLEABLE IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR WATER WORKING AND TEST PRESSURES, SEE PAGE 360



EXTRA HEAVY



HYDRAULIC

The following Straight and Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand from straight patterns, at a special price.

ELBOWS

$\frac{1}{4} \times \frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{4}$	$2 \times \frac{3}{4}$	$4 \times 4$
$\frac{3}{8} \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{1}{2}$	$2 \times \frac{1}{2}$	$5 \times 5$
$\frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 6$
$\frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2$	$8 \times 8$
$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1$	$2\frac{1}{2} \times 1\frac{1}{2}$	$10 \times 10$
$1 \times 1$	$2 \times 2$	$3 \times 3$	$12 \times 12$
$1 \times \frac{3}{4}$	$2 \times 1\frac{1}{2}$	$3 \times 2\frac{1}{2}$	
$1\frac{1}{4} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{4}$	$3 \times 2$	
$1\frac{1}{4} \times 1$	$2 \times 1$	$3\frac{1}{2} \times 3\frac{1}{2}$	

45° ELBOWS

$\frac{1}{4}$	1	$2\frac{1}{2}$	4
$\frac{3}{8}$	$1\frac{1}{4}$	3	5
$\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{1}{2}$	6
$\frac{3}{4}$	2		

LONG SWEEP ELBOWS

1	2	$3\frac{1}{2}$	5
$1\frac{1}{4}$	$2\frac{1}{2}$	4	6
$1\frac{1}{2}$	3		

Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing sizes, but will be made to order by bushing in the sand from the straight patterns, at a special price, according to quantity wanted.

FOR PRICE LIST OF EXTRA HEAVY MALLEABLE IRON FITTINGS,  
SEE PAGES 359 AND 360

FOR GENERAL DIMENSIONS OF EXTRA HEAVY HYDRAULIC MALLEABLE IRON  
FITTINGS, SEE PAGE 698

(CONTINUED ON OPPOSITE PAGE)



# LIST OF SIZES EXTRA HEAVY AND HYDRAULIC MALLEABLE IRON FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

FOR WATER WORKING AND TEST PRESSURES, SEE PAGE 360



EXTRA HEAVY



HYDRAULIC

The following Straight and Reducing Fittings are carried in stock. Other sizes will be made to order by bushing in the sand from straight patterns, at a special price.

## TEES

$\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	$2 \times 2 \times \frac{3}{4}$	$4 \times 4 \times 4$
$\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$	$1\frac{1}{4} \times 1 \times 1\frac{1}{4}$	$2 \times 2 \times \frac{1}{2}$	$4 \times 4 \times 3$
$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	$1\frac{1}{4} \times 1 \times 1$	$2 \times 1\frac{1}{2} \times 2$	$4 \times 4 \times 2\frac{1}{2}$
$\frac{1}{2} \times \frac{3}{8} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$2 \times 1 \times 2$	$4 \times 4 \times 2$
$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	$4 \times 3 \times 4$
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$5 \times 5 \times 5$
$1 \times 1 \times 1$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 5 \times 4$
$1 \times 1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2 \times 2\frac{1}{2}$	$6 \times 6 \times 6$
$1 \times 1 \times \frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$3 \times 3 \times 3$	$6 \times 6 \times 4$
$1 \times \frac{3}{4} \times 1$	$2 \times 2 \times 2$	$3 \times 3 \times 2$	$6 \times 6 \times 3$
$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{4}$	$2 \times 2 \times 1\frac{1}{2}$	$3 \times 3 \times 1\frac{1}{2}$	$8 \times 8 \times 8$
$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	$2 \times 2 \times 1\frac{1}{4}$	$3 \times 2 \times 3$	$10 \times 10 \times 10$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$2 \times 2 \times 1$	$3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2}$	$12 \times 12 \times 12$

## CROSSES

$\frac{1}{4}$	1	$2\frac{1}{2}$	4
$\frac{3}{8}$	$1\frac{1}{4}$	3	5
$\frac{1}{2}$	$1\frac{1}{2}$	$3\frac{1}{2}$	6
$\frac{3}{4}$	2		

## REDUCERS

$\frac{3}{8} \times \frac{1}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times \frac{3}{4}$	$2 \times \frac{1}{2}$
$\frac{1}{2} \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2$
$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{4} \times \frac{1}{2}$	$2 \times 1\frac{1}{2}$	$3 \times 2\frac{1}{2}$
$1 \times \frac{3}{4}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{4}$	$3 \times 2$
$1 \times \frac{1}{2}$	$1\frac{1}{2} \times 1$	$2 \times 1$	$3 \times 1\frac{1}{2}$

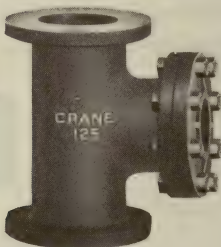
Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing sizes, but will be made to order by bushing in the sand from the straight patterns, at a special price, according to quantity wanted.

FOR PRICE LIST OF EXTRA HEAVY MALLEABLE IRON FITTINGS,

SEE PAGES 359 AND 360

FOR GENERAL DIMENSIONS OF EXTRA HEAVY HYDRAULIC MALLEABLE IRON FITTINGS, SEE PAGE 698

## STANDARD REDUCING FLANGED FITTINGS



It is not possible to carry in stock a line of Reducing Flanged Fittings sufficiently large to meet all demands promptly. We aim to carry a complete line of straight sizes, and an extensive line of reducing sizes, as given on pages 771 and 772.

To avoid delay, we carry in stock a line of

### REDUCING RIBBED FLANGES AS SHOWN ON PAGE 389.

These Flanges, used in connection with straight or reducing fittings carried in stock, enable us to fill orders for reduced sizes very promptly.

**CUSTOMERS WHO DESIRE FITTINGS REDUCED IN THIS MANNER WILL PLEASE SPECIFY "REDUCE BY FLANGES IF NECESSARY."**

These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

### IN ORDERING REDUCING COMPANION FLANGES

always give the screwed or reduced size first, then the outside diameter of Flange wanted; for instance, if a Reducing Flange is required to connect a 6 inch pipe to a 9 inch Flanged Valve or Fitting, having a 15 inch O. D. Flange,

#### ORDER A 6 X 15 REDUCING FLANGE

This will clearly avoid confusion often caused by orders incorrectly calling for a 9×6 or a 6×9 Flange.

LIST OF SIZES  
STANDARD—CAST IRON  
REDUCING FLANGED FITTINGS  
CARRIED IN STOCK

No. 531, REDUCING FLANGED TEES

$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$5 \times 4 \times 3$	$8 \times 8 \times 3\frac{1}{2}$	$10 \times 8 \times 6$
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 4 \times 2\frac{1}{2}$	$8 \times 8 \times 3$	$10 \times 8 \times 5$
$2\frac{1}{2} \times 2 \times 1\frac{1}{2}$	$5 \times 4 \times 2$	$8 \times 8 \times 2\frac{1}{2}$	$10 \times 8 \times 4$
$3 \times 3 \times 2\frac{1}{2}$	$5 \times 3\frac{1}{2} \times 4$	$8 \times 8 \times 2$	$10 \times 7 \times 7$
$3 \times 3 \times 2$	$5 \times 3 \times 3\frac{1}{2}$	$8 \times 7 \times 8$	$10 \times 6 \times 8$
$3 \times 3 \times 1\frac{1}{2}$	$5 \times 3 \times 3$	$8 \times 6 \times 8$	$10 \times 6 \times 6$
$3 \times 3 \times 1\frac{1}{4}$	$4 \times 4 \times 5$	$8 \times 5 \times 8$	$8 \times 8 \times 10$
$3 \times 2\frac{1}{2} \times 3$	$6 \times 6 \times 5$	$8 \times 4 \times 8$	$8 \times 6 \times 10$
$3 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 6 \times 4\frac{1}{2}$	$8 \times 3\frac{1}{2} \times 8$	$6 \times 6 \times 10$
$3 \times 2\frac{1}{2} \times 2$	$6 \times 6 \times 4$	$8 \times 3 \times 8$	
$3 \times 2 \times 2\frac{1}{2}$	$6 \times 6 \times 3\frac{1}{2}$	$8 \times 7 \times 7$	$12 \times 12 \times 10$
$3 \times 2 \times 3$	$6 \times 6 \times 3$	$8 \times 7 \times 6$	$12 \times 12 \times 9$
$2\frac{1}{2} \times 2\frac{1}{2} \times 3$	$6 \times 6 \times 2\frac{1}{2}$	$8 \times 7 \times 5$	$12 \times 12 \times 8$
	$6 \times 6 \times 2$	$8 \times 7 \times 4$	$12 \times 12 \times 7$
$3\frac{1}{2} \times 3\frac{1}{2} \times 3$	$6 \times 6 \times 1\frac{1}{2}$	$8 \times 6 \times 6$	$12 \times 12 \times 6$
$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 5 \times 6$	$8 \times 6 \times 5$	$12 \times 12 \times 5$
$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	$6 \times 4 \times 6$	$8 \times 6 \times 4$	$12 \times 12 \times 4\frac{1}{2}$
$3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 3 \times 6$	$8 \times 6 \times 3$	
	$6 \times 2\frac{1}{2} \times 6$	$8 \times 5 \times 7$	$12 \times 12 \times 3$
$4 \times 4 \times 3\frac{1}{2}$	$6 \times 2 \times 6$	$8 \times 5 \times 6$	$12 \times 12 \times 2$
$4 \times 4 \times 3$	$6 \times 5 \times 5$	$8 \times 5 \times 5$	$12 \times 10 \times 12$
$4 \times 4 \times 2\frac{1}{2}$	$6 \times 5 \times 4$	$8 \times 4 \times 6$	$12 \times 8 \times 12$
$4 \times 4 \times 2$	$6 \times 5 \times 3$	$8 \times 4 \times 4$	$12 \times 6 \times 12$
$4 \times 4 \times 1\frac{1}{2}$	$6 \times 5 \times 2\frac{1}{2}$	$7 \times 7 \times 8$	$12 \times 4 \times 12$
$4 \times 4 \times 1\frac{1}{4}$	$6 \times 4 \times 5$	$6 \times 6 \times 8$	$12 \times 10 \times 10$
$4 \times 3\frac{1}{2} \times 4$	$6 \times 4 \times 4$	$5 \times 5 \times 8$	$12 \times 10 \times 8$
$4 \times 3 \times 4$	$6 \times 4 \times 3$	$9 \times 9 \times 8$	$12 \times 10 \times 6$
$4 \times 2\frac{1}{2} \times 4$	$6 \times 4 \times 2\frac{1}{2}$	$9 \times 9 \times 7$	$12 \times 8 \times 10$
$4 \times 2 \times 4$	$5 \times 5 \times 6$	$9 \times 9 \times 6$	$12 \times 8 \times 8$
$4 \times 3 \times 3$	$5 \times 4 \times 6$	$9 \times 9 \times 5$	$12 \times 8 \times 6$
$4 \times 3 \times 2\frac{1}{2}$	$4 \times 4 \times 6$	$9 \times 9 \times 4$	$12 \times 6 \times 8$
$4 \times 3 \times 2$		$9 \times 9 \times 3$	$10 \times 10 \times 12$
$4 \times 2\frac{1}{2} \times 3$	$7 \times 7 \times 6$	$9 \times 9 \times 2\frac{1}{2}$	$8 \times 8 \times 12$
$4 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$7 \times 7 \times 5$	$9 \times 6 \times 6$	
$4 \times 2 \times 2$	$7 \times 7 \times 4$		$14 \times 14 \times 12$
$3 \times 3 \times 4$	$7 \times 7 \times 3\frac{1}{2}$	$10 \times 10 \times 9$	$14 \times 14 \times 10$
	$7 \times 7 \times 3$	$10 \times 10 \times 8$	$14 \times 14 \times 8$
$4\frac{1}{2} \times 4\frac{1}{2} \times 4$	$7 \times 7 \times 2\frac{1}{2}$	$10 \times 10 \times 7$	$14 \times 14 \times 7$
$4\frac{1}{2} \times 4\frac{1}{2} \times 3$	$7 \times 7 \times 2$	$10 \times 10 \times 6$	$14 \times 14 \times 6$
$4\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{1}{2}$	$7 \times 6 \times 7$	$10 \times 10 \times 5$	$14 \times 14 \times 5$
	$7 \times 5 \times 7$	$10 \times 10 \times 4\frac{1}{2}$	$14 \times 12 \times 14$
$5 \times 5 \times 4$	$7 \times 4 \times 7$	$10 \times 10 \times 4$	$14 \times 12 \times 12$
$5 \times 5 \times 3\frac{1}{2}$	$7 \times 3 \times 7$	$10 \times 10 \times 3\frac{1}{2}$	$14 \times 10 \times 10$
$5 \times 5 \times 3$	$7 \times 6 \times 6$	$10 \times 10 \times 3$	$10 \times 10 \times 14$
$5 \times 5 \times 2\frac{1}{2}$	$7 \times 6 \times 5$	$10 \times 10 \times 2\frac{1}{2}$	
$5 \times 5 \times 2$	$6 \times 6 \times 7$	$10 \times 10 \times 2$	$16 \times 16 \times 14$
$5 \times 5 \times 1\frac{1}{2}$	$5 \times 5 \times 7$	$10 \times 8 \times 10$	$16 \times 16 \times 12$
$5 \times 5 \times 1\frac{1}{4}$		$10 \times 7 \times 10$	$16 \times 16 \times 10$
$5 \times 4 \times 5$	$8 \times 8 \times 7$	$10 \times 6 \times 10$	$16 \times 16 \times 8$
$5 \times 3 \times 5$	$8 \times 8 \times 6$	$10 \times 5 \times 10$	$16 \times 16 \times 7$
$5 \times 2\frac{1}{2} \times 5$	$8 \times 8 \times 5$	$10 \times 4 \times 10$	$16 \times 16 \times 6$
$5 \times 2 \times 5$	$8 \times 8 \times 4\frac{1}{2}$	$10 \times 3 \times 10$	$16 \times 12 \times 12$
$5 \times 4 \times 4$	$8 \times 8 \times 4$	$10 \times 8 \times 8$	$12 \times 12 \times 16$
		$10 \times 8 \times 7$	

(CONTINUED ON FOLLOWING PAGE)

LIST OF SIZES  
**STANDARD—CAST IRON**  
**REDUCING FLANGED FITTINGS**  
 CARRIED IN STOCK  
 (CONTINUED)

**No. 535, REDUCING SINGLE SWEEP FLANGED TEES**

6×6×5	6×6×2½	8×8×3	10×10×6
6×6×4	8×8×6	8×8×6	10×8×8
6×6×3	8×8×5	8×6×4	10×6×6

**No. 536, REDUCING DOUBLE SWEEP FLANGED TEES**

4×4×2	6×6×3	10×10×6	10×10×4
6×6×5	8×8×6	10×10×5	

**No. 539, REDUCING FLANGED CROSSES**

4×4×3×3	6×6×5×5	8×8×5×5	8× 6×8×6
5×5×4×4	6×6×4×4	8×8×4×4	10×10×8×8
5×5×3×3	6×6×3×3	8×8×3×3	10×10×6×6
5×5×2½×2½	8×8×6×6	8×6×6×6	10×10×5×5

**No. 543, REDUCING FLANGED LATERALS**

4×4×2½	8×8×6	10×10×8
6×6×4	8×6×6	10×10×6
6×6×3	8×8×3	10×8×8
6×6×2½		

These sizes as listed above and on opposite page, with our Special Reducing Companion Flanges, enable us to furnish from stock about every variety of Fittings required, except Special Angles, Offsets, etc.

Reducing Ribbed Flanges are carried in stock as per table, page 389. These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter unless otherwise ordered.

Customers who desire Fittings reduced in this manner will please specify "Reduce by Flanges if necessary."

**PRICES OF SIZES NOT CARRIED IN STOCK**

SIZES NOT COVERED IN THE LIST OF SIZES CARRIED IN STOCK, AS GIVEN ABOVE AND ON OPPOSITE PAGE, WILL BE CONSIDERED SPECIAL AND MADE TO ORDER AT THE FOLLOWING ADVANCE IN PRICES, ACCORDING TO THE QUANTITY OF A SIZE ORDERED AT ONE TIME, VIZ.:

**ADD TO THE REGULAR LIST PRICES OF REDUCING FLANGE FITTINGS ON PAGES 420 TO 432 THE PERCENTAGE ADVANCES GIVEN BELOW**

SIZE	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More
3½ Inch and Smaller . .	100%	80%	60%	40%	20%	No Advance
4 to 8 Inch . . . . .	50%	40%	30%	20%	10%	No Advance
9 and 10 Inch . . . .	25%	20%	15%	10%	5%	No Advance

Sizes 12 inch and larger, will be made to order in quantities, of one or more of a size, at the regular list and discount.

We do not make Single Sweep Tees with side openings larger than the run.

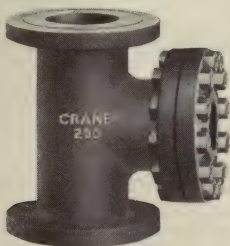
Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted we will alter patterns (which will be expensive) and charge at a special price.

On Double Sweep Tees, we can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

Furnished faced only, unless otherwise ordered.

General dimensions, pages 702 to 705. Templates for drilling, page 650.

## EXTRA HEAVY REDUCING FLANGED FITTINGS



It is not possible to carry in stock a line of Reducing Flanged Fittings sufficiently large to meet all demands promptly. We aim to carry a complete line of Straight Sizes and an extensive line of Reducing sizes, as given on pages 774 and 775.

To avoid delay, we carry in stock a line of

### REDUCING RIBBED FLANGES AS SHOWN ON PAGE 394.

These flanges, used in connection with Straight or Reducing Fittings carried in stock, enable us to fill orders for Reduced Sizes very promptly.

**CUSTOMERS WHO DESIRE FITTINGS REDUCED IN THIS MANNER WILL PLEASE SPECIFY "REDUCE BY FLANGES IF NECESSARY."**

These Flanges will always be the same thickness as the Regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

### IN ORDERING REDUCING COMPANION FLANGES,

always give the screwed or reduced size first, then the outside diameter of Flange wanted; for instance, if a Reducing Flange is required to connect a 6 inch pipe to a 9 inch Flanged Valve or Fitting, having a 16¼ inch O. D. Flange,

**ORDER A 6 X 16¼ REDUCING FLANGE**

This will clearly avoid confusion often caused by orders incorrectly calling for a 9×6 or a 6×9 Flange.



## LIST OF SIZES

# EXTRA HEAVY—CAST IRON

## REDUCING FLANGED FITTINGS

## CARRIED IN STOCK

## No. 107 E, REDUCING FLANGED TEES

$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	$5 \times 5 \times 3\frac{1}{2}$	$7 \times 7 \times 3$	$10 \times 8 \times 10$
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 5 \times 3$	$7 \times 7 \times 2$	$10 \times 6 \times 10$
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4}$	$5 \times 5 \times 2\frac{1}{2}$	$7 \times 6 \times 7$	$10 \times 8 \times 8$
$2\frac{1}{2} \times 2 \times 2$	$5 \times 5 \times 2$	$7 \times 6 \times 6$	$10 \times 8 \times 6$
$3 \times 3 \times 2\frac{1}{2}$	$5 \times 5 \times 1\frac{1}{2}$	$7 \times 5 \times 5$	$10 \times 8 \times 5$
$3 \times 3 \times 2$	$5 \times 4 \times 5$	$6 \times 6 \times 7$	$10 \times 6 \times 8$
$3 \times 3 \times 1\frac{1}{2}$	$5 \times 3 \times 5$	$8 \times 8 \times 7$	$10 \times 6 \times 6$
$3 \times 3 \times 1\frac{1}{4}$	$5 \times 2\frac{1}{2} \times 5$	$8 \times 8 \times 6$	$8 \times 8 \times 10$
$3 \times 3 \times 1$	$5 \times 4 \times 4$	$8 \times 8 \times 5$	$7 \times 7 \times 10$
$3 \times 2\frac{1}{2} \times 3$	$5 \times 4 \times 3$	$8 \times 8 \times 4\frac{1}{2}$	
$3 \times 2 \times 3$	$5 \times 4 \times 2\frac{1}{2}$	$8 \times 8 \times 4$	$12 \times 12 \times 10$
$3 \times 1\frac{1}{2} \times 3$	$5 \times 3 \times 4$	$8 \times 8 \times 3\frac{1}{2}$	$12 \times 12 \times 9$
$3 \times 1\frac{1}{4} \times 3$	$5 \times 3 \times 3$	$8 \times 8 \times 3$	$12 \times 12 \times 8$
$3 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$4 \times 4 \times 5$	$8 \times 8 \times 2\frac{1}{2}$	$12 \times 12 \times 7$
$3 \times 2 \times 2$		$8 \times 8 \times 2$	$12 \times 12 \times 6$
$2 \times 2 \times 3$	$6 \times 6 \times 5$	$8 \times 6 \times 8$	$12 \times 12 \times 5$
	$6 \times 6 \times 4\frac{1}{2}$	$8 \times 4 \times 8$	$12 \times 12 \times 4$
$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 6 \times 4$	$8 \times 3 \times 8$	$12 \times 12 \times 3$
$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	$6 \times 6 \times 3\frac{1}{2}$	$8 \times 7 \times 6$	$12 \times 12 \times 2\frac{1}{2}$
$3\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$	$6 \times 6 \times 3$	$8 \times 7 \times 5$	$12 \times 10 \times 12$
	$6 \times 6 \times 2\frac{1}{2}$	$8 \times 6 \times 7$	$12 \times 8 \times 12$
$4 \times 4 \times 3\frac{1}{2}$	$6 \times 6 \times 2$	$8 \times 3 \times 6$	$12 \times 10 \times 10$
$4 \times 4 \times 3$	$6 \times 5 \times 6$	$8 \times 6 \times 5$	$12 \times 10 \times 8$
$4 \times 4 \times 2\frac{1}{2}$	$6 \times 4 \times 6$	$8 \times 6 \times 4$	$12 \times 10 \times 6$
$4 \times 4 \times 2$	$6 \times 3 \times 6$	$8 \times 5 \times 6$	$12 \times 8 \times 8$
$4 \times 4 \times 1\frac{1}{2}$	$6 \times 2\frac{1}{2} \times 6$	$8 \times 5 \times 5$	$12 \times 8 \times 6$
$4 \times 3 \times 4$	$6 \times 5 \times 5$	$8 \times 4 \times 6$	$10 \times 10 \times 12$
$4 \times 2\frac{1}{2} \times 4$	$6 \times 5 \times 4$	$8 \times 4 \times 4$	$8 \times 8 \times 12$
$4 \times 2 \times 4$	$6 \times 5 \times 3$	$6 \times 6 \times 8$	
$4 \times 3 \times 3$	$6 \times 5 \times 2\frac{1}{2}$	$5 \times 5 \times 8$	$14 \times 14 \times 12$
$4 \times 3 \times 2$	$6 \times 5 \times 2$	$9 \times 9 \times 6$	$14 \times 14 \times 10$
$4 \times 3 \times 1\frac{1}{2}$	$6 \times 4 \times 5$	$9 \times 9 \times 5$	$14 \times 14 \times 8$
$4 \times 2\frac{1}{2} \times 2\frac{1}{2}$	$6 \times 4 \times 4$		$14 \times 14 \times 7$
$4 \times 2 \times 3$	$6 \times 4 \times 3$	$10 \times 10 \times 8$	$14 \times 14 \times 6$
$3 \times 3 \times 4$	$6 \times 3 \times 3$	$10 \times 10 \times 7$	$14 \times 14 \times 5$
$2\frac{1}{2} \times 2\frac{1}{2} \times 4$	$5 \times 5 \times 6$	$10 \times 10 \times 6$	$14 \times 12 \times 8$
	$4\frac{1}{2} \times 4\frac{1}{2} \times 6$	$10 \times 10 \times 5$	
$4\frac{1}{2} \times 4\frac{1}{2} \times 3$	$4 \times 4 \times 6$	$10 \times 10 \times 4\frac{1}{2}$	$16 \times 16 \times 10$
$4\frac{1}{2} \times 4\frac{1}{2} \times 2$		$10 \times 10 \times 4$	$16 \times 16 \times 8$
$4\frac{1}{2} \times 4 \times 4\frac{1}{2}$	$7 \times 7 \times 6$	$10 \times 10 \times 3\frac{1}{2}$	$16 \times 16 \times 7$
	$7 \times 7 \times 5$	$10 \times 10 \times 3$	$16 \times 16 \times 6$
$5 \times 5 \times 4$	$7 \times 7 \times 4$	$10 \times 10 \times 2$	

(CONTINUED ON OPPOSITE PAGE)

LIST OF SIZES  
**EXTRA HEAVY—CAST IRON**  
**REDUCING FLANGED FITTINGS**  
**CARRIED IN STOCK**  
 (CONTINUED)

**No. 111 E, REDUCING SINGLE SWEEP FLANGED TEES**

4×4×2½	6×6×4	8×8×6
4×4×2	6×4×4	8×6×6

**No. 112½ E, REDUCING DOUBLE SWEEP FLANGED TEES**

5×5×4	6×6×3	8×8×5
5×5×3	8×8×6	

**No. 115 E, REDUCING FLANGED CROSSES**

3×3×2½×2½	8×8×6×6
4×4×2½×2½	8×8×5×5
6×6×4×4	8×8×4×4
6×6×3×3	

**No. 119 E, REDUCING FLANGED LATERALS**

4×4×2½	6×6×2½
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These sizes as listed above and on opposite page with our Special Reducing Companion Flanges, enable us to furnish from stock about every variety of fittings required, except Special Angles, Offsets, etc.

Reducing Ribbed Flanges are carried in stock as per table on page 394. These Flanges will always be the same thickness as the regular Companion Flanges of corresponding outside diameter.

The Flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

Customers who desire Fittings reduced in this manner will please specify "Reduce by Flanges if necessary."

**PRICES OF SIZES NOT CARRIED IN STOCK**

SIZES NOT COVERED IN THE LIST OF SIZES CARRIED IN STOCK, AS GIVEN ON OPPOSITE PAGE, WILL BE CONSIDERED SPECIAL AND MADE TO ORDER AT THE FOLLOWING ADVANCE IN PRICES, ACCORDING TO THE QUANTITY OF A SIZE ORDERED AT ONE TIME, VIZ.:

**ADD TO THE REGULAR LIST PRICES OF REDUCING FLANGED FITTINGS, PAGES 438 TO 450, THE PERCENTAGE ADVANCES GIVEN BELOW**

SIZE	1 Piece	2 Pieces	3 Pieces	4 Pieces	5 Pieces	6 or More
3½ Inch and Smaller . .	50%	40%	30%	20%	10%	No Advance
4 to 8 Inch . . . . .	25%	20%	15%	10%	5%	No Advance

Sizes 9 inches and larger, will be made to order in quantities, of one or more of a size, at the regular list and discount.

We do not make Single Sweep Tees with side openings larger than the run.

Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted, we will alter patterns (which will be expensive) and charge at a special price. On double Sweep Tees, we can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

Furnished faced only, unless otherwise ordered.

General dimensions, pages 706 to 709. Templates for drilling, page 652.





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